

## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.



6261 Wm. McD. STONE

SOYBEAN AND CORN SPECIALIST

ATWATER FORTAGE CO. OHIO



"THE RESULT"

STONE'S EUREKA  
ENSILAGE CORN

(SEE BACK COVER FOR  
THE CAUSE)



## THE GREAT RESPONSIBILITY AND OPPORTUNITY OF THE 1915 AMERICAN FARMER

The European war, the greatest war of all this world's history, has not only given to American business men, especially American farmers, great and wonderful opportunities for doing profitable business but it has also placed a great responsibility on American farmers as well.

Over 10,000,000 of Europe's best able-bodied working men, the largest proportion of them farmers, have been taken from their regular occupations as producers of the necessities of life and put to the work of destroying human life and property in a wholesale way. The complete history of the world can show no war which for losses can make at all any comparison to this one.

Europe's great population has never had too much to eat in its best times of plentiful harvest.

Now since its countless armies of hitherto its best farmers, are engaged in works of destruction on an awful scale, instead of growing and harvesting the food crops all so necessary there, it behooves us as American farmers to try to make up at least a part of the great deficiency in the food crops that is sure to exist in Europe before many months. We ought to do this because, in the first place, it is our duty to try our best to sustain human life dependent on us, and in the second place, because it will most certainly pay us remarkably well to do so.

None of us can fully realize the responsibilities which rest on us as stewards of America's fertile soil, for all that we can possibly grow for food and clothing will be needed and needed very badly before another year passes and if the war keeps on the need will keep increasing.

We have had a constantly increasing obligation here in America as well, not to speak of Europe.

It is quite a different proposition to consider the growing of food for over a 100,000,000 of people and the production of food for 50,000,000 or 60,000,000. This alone is becoming a mighty problem.

If ever there was a time when American farmers should and ought to make a thorough study as well as practice of the profession of agriculture and the art of farming it is **now**. Stern responsibility demands and golden opportunity pleads with us that we do our best as tillers of the American soil.

**Will we do it?**

## INTRODUCTION

For several years we have noticed that all of the agricultural authorities in America have been gradually devoting a larger share of their time to the discussion of two very important and far-reaching subjects, subjects which are rapidly becoming of great consequence.

The first of these subjects is the great question or problem of not only preserving but from vital necessity, increasing the supply of available plant-food nitrogen in our American soils.

Of phosphorus we have not only in our soils a fair supply but in our American phosphate mines already enough in sight to last for hundreds of years. While we have no developed potash mines, as in Germany's case, yet our average American soils contain an enormous quantity of potash, much more so than the other elements nitrogen and phosphorus, and though most of it is in an unavailable form, yet with good farming methods a good supply will be made available as a plant food.

**Nitrogen in a form available as a plant food is one of the most necessary of all plant foods, the one in least supply, and consequently the highest-priced of all to buy.**

The other great problem is the problem of securing a fairly cheap and abundant source of digestible protein food, so absolutely necessary for the proper development of the live stock industry on the millions of American farms.

Many of the so-called successful American farmers of the past generation made their farms rich and productive at the expense of the soil of the neighboring farms, from whose owners they purchased all their surplus forage and grain for use on their own farms. We have often heard the expression "Rob Peter to pay Paul," but what about these men who each robbed perhaps six or eight farms in order to make his own farm rich. The standard set forth for the successful farmer of today is to make his own farm much more productive but by much better methods than the wholesale robbery of the fertility of other farms.

Perhaps, farmers as a class have not advanced so far in the solution of the protein-supply problem as they have in the other. Yet since nitrogen bears much the same relation to the plant which does protein to animal life, and protein is largely nitrogen, really then the two are so bound together that the solution of one is very apt to be the solution of the other. When linseed oil cake, bran and middlings and such protein by-products could be bought for almost a song, it was rather a difficult matter to induce a lot of old farmers to go to any special work or expense to grow their protein for the livestock. A large proportion of them, not a very great many years ago, did not know what the word "protein" meant. But the steadily increasing prices of all the different protein grain foods are finally forcing most live stock growers into such a position that they are almost compelled to study the problem and to attempt to work out some satisfactory solution to it.

It is to our very much esteemed friend, Dr. Chas. E. Thorne, Director of the Ohio Agricultural Experiment Station at Wooster, O., that we owe the start of the inspiration to engage in the culture of the soybean or soy as it is often called.

This plant has not only been the means directly of largely solving the two great problems of American agriculture but indirectly, through a study of its great possibilities a great army of American farmers have been induced to give far more interest than formerly to the scientific and practical use of the other legumes. At the time Dr. Thorne advised us to grow soybeans in place of oats in our rotation of crops, very few Ohio farmers, comparatively speaking, seemed to know anything at all about the crop. To show what a wonderful change is coming over the United States, in the attitude of farmers, generally speaking, towards the growing of new kinds of crops, it is reported by the U. S. Dept. of Agriculture that through the missionary efforts of their county agricultural agents alone, over 78,000 more acres of soybeans have been grown; we presume in 1914.

Considering the fact that the soybean was practically unknown to American farmers only five or six years ago, its growth into such popularity among

the most conservative class of men in this country has been nothing short of remarkable.

It is now acknowledged by practically all of the world's great agricultural authorities that **any system of profitable and permanent agriculture, in the fullest meaning of the term, must have for its foundation principle**

#### THE UNIVERSAL CULTURE OF THRIFTY, WELL INOCULATED LEGUMES.

The three greatest requisites in the growing of such crops are legume seeds, bacterial inoculation for the seeds and agricultural lime with which to sweeten the soil. We are better equipped to furnish all of these than is any other establishment in America.

## THE SOYBEAN AND PROTEIN PROBLEM

On account of the tremendous increase in population of the large cities all over this country, most of the live stock farms have been changing very rapidly from cattle-growing to dairy farms. This is especially true in the north-east quarter of the U. S. While an abundance of protein food is necessary for best results in any kind of live stock production yet a large proportion of stockmen were not trying very hard to get best results, so they fed their cattle mostly corn and timothy hay, with some clover when they happened to have some.

Now in changing to dairying most of them have already found out that it is absolutely necessary to have a good liberal supply of protein grain and forage in order to secure the best results.

On the average American farm but a very small proportion of the protein feed is grown that is necessary for a proper development or growth of the live stock which the farm should keep. Only a small proportion of American farmers grow even a plentiful supply of clover hay. No high-producing dairy cow is able to secure all the protein feed which she needs, from red clover hay alone. Neither will the grains commonly grown in the past on the ordinary farm, such as corn, oats and wheat, furnish the amount or kind of protein needed to properly balance the feed ration for dairy cows.

Where then, as a rule, does the American dairyman get his protein feed? Well, he buys it in the commercial feed sacks, and helps his brother farmers to bid up, higher and higher, the prices of these feeds, put up and sold by the great milling companies of this nation. After they, the dairymen, have deducted from the amount of their cream checks, their bills for bran, linseed oil meal and other protein feeds necessary to properly balance up the dairy rations with their farm-grown timothy hay and cornfodder, they have but little cash remaining. To increase the size of the cash balances remaining from these cream checks several changes should be made in farm management.

First: Grow the high-priced protein feed on your own farms, instead of buying it.

Second: Feed all the farm grown feed to much better cows.

Third: Make plans to get better prices for both milk, butter and calves.

No other business could endure such systematic robbery as has the American dairy industry suffered for years. Certainly it has been the easy and generally willing prey of worthless "boarder" cows, of extortionate feed-dealers and of unscrupulous milk buyers. The dairy industry had better part with these incumbrances as soon as possible.

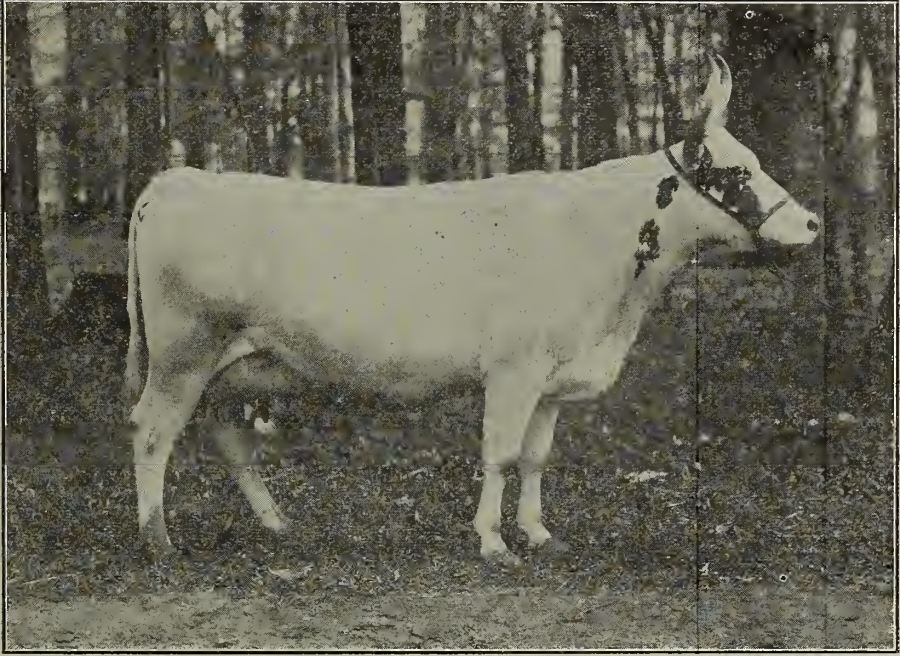
What crop will best furnish the rich protein feed to properly balance up the rations in connection with other farm-grown feeds? That crop is **The Soybean.**

The corn crop long ago solved the problem of furnishing the bulky carbohydrates food for dairy and beef cattle, supplemented of course by ordinary farm grown hay. The growing of soybeans is the most natural and reasonable way of producing the high-analyzing protein feed on the average American farm.



In most sections it will very handily take the place of oats in a corn, oats, wheat, clover rotation, or if the soybean ground cannot be put to wheat in time, then clover may be sown with oats the following spring, thus keeping up the four year rotation.

**One of the World's Record-Breaking Cows Which Has Its Daily Ration of Stone's Soybean Silage.**



Lessnessock Buntie, No. 31685. World's Champion 2-year-old Ayrshire. Record 14678 lbs. of milk and 512.4 lbs. of butter fat.

The best way to judge the value of a dairy cow is by her production of milk and butter the year round. "By their deeds shall ye know them." The advanced registry work with America's purebred dairy cattle is proving to be of enormous value in developing a genuinely profitable dairy industry. The careful professional work in this line done on South Farm and other great dairy farms should merit the greatest of commendation from all Americans, whether farmers or not.

Every dairy farmer should aim to improve his cattle by securing foundation stock from the breeders who prove the ability of their cows by actual production at the pail. Get rid of the "boarder" cows and breed up cows that will make you a good profit.

On account of the analysis of soybean grain being so high in digestible protein, over three times as much digestible protein can be raised in an acre of good soys as in an acre of good oats. Don't you think that fills the bill nicely for what the dairymen need? We think so. The foremost dairymen in the U. S. have begun to grow soybeans in their rotation in place of oats, not only because protein grain can thus be grown cheaply, but also because they realize they should not run the unnecessary and large risk of feeding the market protein feeds, the purity and quality of which they know but very little, to valuable dairy cows, some of them worth thousands of dollars.

If they can grow all the feed for these cows on the farm as they can do in a corn, soybeans, wheat, clover rotation or a corn, soybeans, oats, clover

rotation they have not only eliminated a large feed bill but a larger risk of possible injuring the health of their cattle by feeding questionable feed.

In 1908 and 1909, the Ohio Agricultural Experiment Station conducted some experiments to determine the value of soybean or alfalfa hay as a substitute for high-priced commercial protein feeds in milk and butter production. The experiments proved very conclusively that the use of milling by-products or other commercial feeds is not necessary in milk production, when soybeans or alfalfa hay can be produced in fair quantities by the dairyman farmer. Soybean hay in these tests showed equal efficiency, according to its chemical analysis to the high priced commercial feeds. Read circulars 78 and 132 and bulletins 237 and 267, issued by Ohio A. E. Station.

Wisconsin, Tennessee, Indiana and other experiment stations have also conducted very careful experiments with feeding soybean hay, soybean grain and soybean straw in comparison with other feeds, which have proved the wonderful value of this plant as a food for all kinds of live stock. Write to the U. S. Dept. of Agriculture at Washington, D. C., and request them to send you their bulletin on the Soybean and find out what a wonderful live-stock food is the soybean both for grain, hay, straw, soiling crop or ensilage.

How very valuable as a protein feed is the soybean may be judged by comparison with other farm crops in analysis of protein as follows: Soybean grain, 36.3%; oats, 11.8%; corn, 10.5%; barley, 12.4%; rye, 10.6%; buckwheat, 10%; flaxseed, 22.6%; cowpeas, 23.5%; sunflower seed, 16.3%; cottonseed (with hulls), 19.6%; wheat, 11.9%.

Soybean hay, 15.4%; alfalfa, 14.3%; cowpea hay, 16.6%; peavine hay, 13.7%; vetch hay, 17%; crimson clover, 15.2%; alsike clover, 12.8%; red clover, 12.4%; orchard grass hay, 8.1%; red top, 8%; blue grass, 7.8%; mixed grasses, 7.4%; timothy, 6%; cornfodder, 5.1%; corn stover, 4.5%.

Soybean silage, 4.1%; cowpea silage, 2.7%; peavine silage, 5.9%; corn silage, 1.9% to 2.2%; sorghum silage, 0.8%.

The above analyses are from Bulletin No. 155, of Ohio Agricultural Station at Wooster, O. Notice the higher protein content of all the legumes in the above list, compared with the non-legumes.

When we consider that soybeans are planted after corn is planted, without interfering with that work; that from 20 to 40 (60 lb.) bushels of this rich protein grain can be grown to the acre and that from one to three tons of cured hay and as high as 12 tons of soybean silage can be grown to the acre, we begin to realize some of the wonderful possibilities of this crop.

It has been found by experiment that soybeans are worth about 10% more than middlings as a hog feed. When substituted for oats in a corn and oats grain feed for lambs, they gave very larger gains both in wool and weight of carcass than did those lambs fed corn and oats. The consumption of pounds of feed to each pound of grain was also much less with the lambs fed corn and soys.

We believe that the poultry business is going to prove one of the large bidders for the commercial soybean grain crop. Progressive poultrymen are not afraid to feed new grains if evidence is in their favor. We find that chickens love every kind of ripe soybean, regardless of size or color and the effect of eating such high protein grain soon shows in increased egg production in winter time when eggs are high.

Several of the most prominent manufacturers in the United States are now using soybean oil very largely or else exclusively in the production of special-purpose high-priced paints. Soybean oil is considered very much superior to linseed oil for such purposes and the paint produced is much more satisfactory.

Manchuria alone ships thousands of tons of soybean oil cake, the by-product of her soybean oil business, to other countries for use as dairy feed. Some of our most prominent dairymen customers on the Pacific Coast have written to us in highest terms of the value of soybean oil cake as a dairy feed. It is fed in large quantities to dairy cattle in that part of America.

Seed of over 300 varieties of soybeans have been imported from India, China, Japan, Siberia, Manchuria, and other nations by the U. S. Dept. of Agriculture and tested by it as to grain and forage yields and other qualifications.

We have tried out about 50 of the best varieties and sell to our customers only



those varieties which have proved to be the most satisfactory for either grain, hay, ensilage, or green manuring.

The time is not far distant when but comparatively few progressive livestock farmers will not grow soybeans as one of their regular farm crops.

## SOYBEANS FOR ENSILAGE

A large proportion of the soybeans now grown on dairy farms are cut for ensilage. This saves the whole plant; leaves, stems and grain and at a time when it contains the most digestible food. Soybeans do not make good-keeping ensilage by themselves because they are hollow-stemmed. But if mixed with corn for ensilage, the sap from the green corn will fill up these hollow stems and the silage will keep very well and will also be mixed, ready for feeding.



A field of inoculated Medium Green Soybeans on Lone Elm Farm, grown in 1914, a year of great drouth.

Since soybean silage analyzes very high in protein and corn silage very low, if the two be mixed at silo-filling time at the rate of one part soys to about two parts of corn, the silage will have its protein content so largely increased that but little grain will have to be fed with it, in order to balance up feed rations properly. About five feet of the top layer of ensilage should be all corn silage.

There are three ways in which soybeans may be grown for ensilage. The first way and (we think) the best way for average conditions existing in the Corn Belt is to plant them apart from the corn and give them the same treatment as one would give if they were grown for grain production. They should be harvested if possible just before the leaves begin to fall, using a grain binder, cutting two 28-inch rows at a round.

The soys then will not have to be planted until after corn is planted and ground is well warmed up. They can then receive just exactly the care needed for best results. The time of planting the different varieties can be gauged to suit the time at which corn is to be cut for ensilage. If corn is not cut until about October 1st, do not plant Medium Green Soys until June 20th, or they will get too ripe for ensilage by cutting time.

Roosevelt soys can be planted about the same time. Ohio 7455 can be planted earlier, and Peking can be planted about the same time as the corn, to be ready at cutting time. Plant  $\frac{1}{2}$  bushel Peking,  $\frac{5}{8}$  bushel of Roosevelt,  $\frac{3}{4}$  bushel Medium Green, or 1 bushel of either Ohio 7455 or Ohio 9035 per acre.

The second way advised by some farmers for planting soys for ensilage, is broadcasting the seed, using every feed cup in grain drill for the work, and using from three to four times as much seed per acre as used when planted in 28-inch rows.

The soys will grow taller than if planted in rows; they will be easier to harvest with a binder for ensilage; they will not have to be cultivated, and possibly will add more fertility to the soil on account of more roots (to the square yard) covered with nodules. They will also give a large amount of grain and perhaps more forage if grown this way than if planted in rows.

### IF!

It does not either rain or turn cold after planting or do both before the soys are large enough to shade the ground completely. In case the weather does turn bad you will have a very unsatisfactory crop. Since the possible loss is so many times greater by this method than the possible gain we do not advocate this method. Our customers may do as they see fit to do.

The third way advocated is to plant them in the same rows with the corn and treat them almost as if they were corn plants. The idea is to substitute a solid growth of soybean plants from one corn stalk to the next in place of the more common sight; rows of weeds and fall grass in so many cornfields, grown for ensilage.

This plan has several advantages as well as disadvantages. It is more suitable for farmers who grow the ordinary early Ohio field corn for ensilage, especially on farms in New York, Michigan and other like latitudes where ensilage is harvested earlier than in Ohio. One principal reason for this is that the soybean plants will have a better comparative show when planted with these varieties of corn than when planted with great tall ensilage corn. This plan will produce a crop to be harvested all at one time by the corn harvester, and all mixed up in the bundle to be run through the cutting box and it will take but little extra time, in fact, to plant, cultivate and harvest it.

In 1912 one of the largest soybean-corn ensilage growers in New York State carried on an experiment, growing hills of corn under the same conditions, except that he planted soybeans in with some of the hills of corn and inoculated the soys.

He claims that the weight of the cornstalks in the hills where only corn was planted was only one-half as much as the weight of the cornstalks in the hills where the inoculated soys also grew.

It will pay every progressive farmer to read the remarkable bulletin, published by Cornell University Experiment Station of New York, No. 294, entitled "A Heretofore Unnoted Benefit From the Growth of Legumes." It describes experiments made there, concerning the effect on the protein analysis of timothy produced by growing it in connection with either inoculated alfalfa or inoculated red clover and the effect on the protein analysis of oats, grown in connection with Canada field peas.

The effects produced were remarkable but require considerable study for thorough understanding. In brief the following results were obtained:

Timothy grown with alfalfa contained from 8% to 22% more protein than when grown alone.

Timothy grown with red clover contained 44% more protein than when grown alone.

Oats grown with field peas contained 7% to 34% more protein than oats grown alone.

All well posted farmers know that all legume crops store up supplies of nitrogen plant food in the form of tubercles or nodules on their roots during growing season, but it is very doubtful that non-legume plants growing next to legume

plants could utilize any of these nodules for food while the legumes themselves were alive and growing. It was therefore very self-evident that this remarkable increase in the protein content of the non-legumes must be explained by some other means.

They carried on more experiments then with soils from both limed and unlimed timothy and alfalfa plots and found that another kind of bacteria, the nitrifying kind, were doing their work of preparing nitrogen in available form as plant food at different rates in the different kinds of soils. It was found by careful tests that the nitrifying bacteria in the unlimed soil which had grown alfalfa one year before and had been kept free from any growing vegetation since were making nitrogen plant food available 130% faster than in unlimed timothy soil under same conditions. **And limed alfalfa soil was found capable of producing nitrogen food for plants (which largely makes the protein part of them) at nearly three times the speed that the unlimed timothy soil could produce it.**

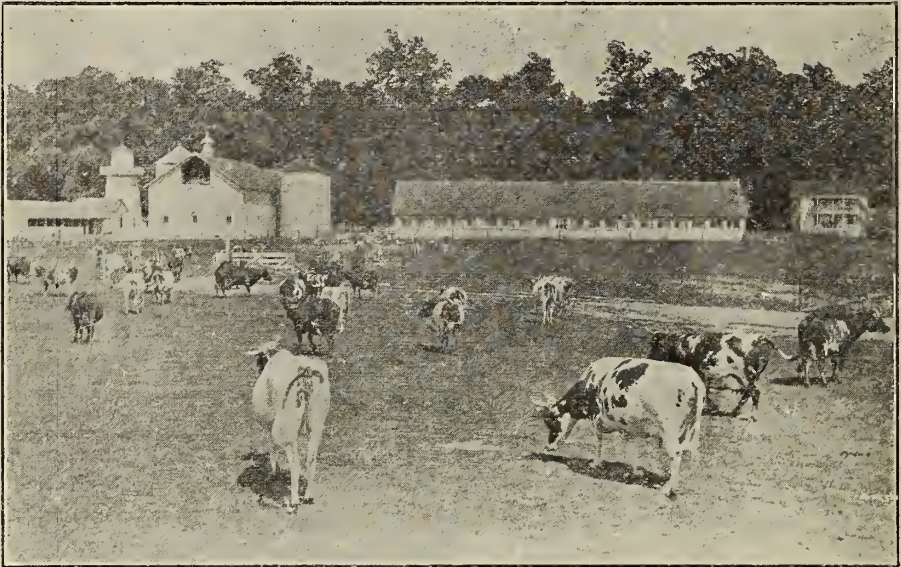
The experiments proved very conclusively that we ought to grow inoculated legume crops in connection with non-legumes if possible, if only for the increase in the richness of the non-legume crop, not to speak of the added tonnage per acre. In this set of experiments it was found that oats and field peas grown together produced 1000 to 1100 lbs. more hay per acre than oats grown alone.

**THE EFFECT OF THE INOCULATED SOYBEANS GROWING WITH THE CORN SEEMS TO BE MUCH LIKE THAT PRODUCED BY THE INOCULATED CLOVER GROWING WITH THE TIMOTHY.**

The disadvantages of this third method of growing soybean-corn ensilage is principally a matter of comparison. To make a close approach to a balanced ration in the silo, the ensilage should be about one-third soybeans. If the regular amount of seed corn be planted then there will not be much use in planting in the same rows with seed corn, any more than 6 quarts of Peking Soys or 8 quarts of Medium Green Soys per acre.

While this amount of soys growing with the corn will help increase the protein analysis in the silage very much, it will not furnish as large a proportion of soybeans as we think best in the silage. If the rows were only 36 inches or 32 inches apart and the corn stalks were not quite so close together in the row, then one would have a large proportion of soys and would utilize the ground better, without materially decreasing the yield of the corn, because 28 or 30 inches is about the full width of soybean rows in good thrift.





View of some of the silos and dairy barns on the famous South Farm at Willoughby, O. The expert manager of this great Ayrshire dairy cattle farm, Mr. Geo. A. Cross, told us that they put up about 1,000 tons of soybean-corn silage last fall to use in feeding their best record-breaking milk producers. He is a firm believer in soybean-corn silage for large as well as economical milk production. Thousands of the best dairymen in America believe this to be true and the number of believers is increasing very fast.

Proprietor  
JOHN SHERWIN  
247 Euclid Avenue  
Cleveland, O.

Manager  
GEO. A. CROSS  
South Farm  
Willoughby, O.

#### SOUTH FARM

Willoughby, Ohio

BREEDERS OF AYRSHIRE CATTLE

Dec. 21, 1914

Mr. Wm. McD. Stone,  
Atwater,  
Portage Co., Ohio.

Dear Sir:

I am sending you photo of our champion two-year-old Ayrshire Lessnessock Buntie No. 31685, record 14,678 lbs. milk containing 512.40 lbs. butter fat. We have 11 two-year-olds with records better than ten thousand, and three with records over twelve thousand. We also have an ex-champion three-year-old with a record of 15,056 lbs. milk, 589 lbs. fat. These cows were fed on Soybean-Corn Silage. I wish to state that the Soybean seed that I bought of you last April was perfectly satisfactory and you may plan on me for a much larger order next spring.

Very truly yours,

GEO. A. CROSS.

## INOCULATION

We wish to emphasize this point: Be sure to inoculate the soys which you grow with your corn. Why?

1st. To help very much the growth of the soybeans, especially so if the soil is not very fertile.

2nd. To keep them from competing with the corn for the supply of the soil's nitrogen.

3rd. To help the growth of the corn.

4th. Experiments have proven that inoculated soys are richer in protein than are those not inoculated.

5th. To help the following crop in that field, by means of the nitrogen stored up on the soybean roots, when they are inoculated.

We are illustrating on front cover of this book a view of a field of Stone's Eureka Ensilage Corn, which was planted about June 25, 1914, in one of our fields, which for several years in succession previously had been growing inoculated soybeans. No manure, lime or fertilizer was applied to this field during 1914, yet the crop, though late planted, yielded at the rate of 29 $\frac{3}{4}$  tons of green feed per acre at cutting time in spite of the severe drouth lasting during summer.

The thrifty color which the corn held all during the growing season showed very plainly the presence in the soil of a plentiful supply of nitrogen available as plant food, stored there by the bacterial work of the preceding soybean crops. We have noticed the same rich dark green color in the oats and wheat crops in each of our fields, when following a soybean crop in rotation. In 1914 we harvested our champion wheat crop to date from a field of pedigree Poole wheat planted on soybean stubble about the 1st of October, 1913. If the soybean crop be well inoculated, we believe the wheat crop following the soybean crop will be apt to yield several bushels per acre more than it would ordinarily yield.

The surest and best way to inoculate the soybean roots is by the use of soybean bacteria-inoculated soil. It can either be broadcasted over the field before planting or else sifted and drilled in with seed.

It will take about 100 pounds per acre of inoculated soil, used in this way to inoculate the soys well the first year they are planted. After that the field is inoculated for soybeans, practically forever.

Protect the inoculated soil from bright sunshine, or the bacteria in it will be largely killed. If the soil gets very dry before it is used it will have the same effect on the bacteria. Since the cost of the inoculated soil, with even long freight rates added is not any more than the cost of cheap fertilizer, the gain from its use is large, and once inoculated the soil is inoculated forever, it would certainly seem to be wise to use it plentifully the first year. After that you will have all the inoculated soil you want for yourself and inoculated soil to sell to your neighbors.

## METHODS OF PLANTING SOYBEAN-CORN SILAGE FIELDS

Several methods are used for planting the combination corn-soybean ensilage fields.

The first method and common one is to mix the two kinds of seeds together very thoroughly and then plant them just as if they were all kernels of corn. Then sow the inoculated soil as fertilizer through the fertilizer boxes.

The second method is to plant the soybeans with the corn planter, using the inoculated soil as fertilizer and then go over the field afterwards with the hand planter, planting the corn in hills along in the soybean rows.

The third method is to plant the corn first with the two-horse planter, using fertilizer in the fertilizer boxes, and then drive right over the same rows again, planting the soys very shallow and sowing the inoculated soil at the same time.

The fourth method is to secure from the manufacturer of corn planters, seed-planting plates to be used instead of fertilizer cups and then plant seed corn with one set of plates and soys with the other set in the fertilizer boxes.

The fifth method is to plant the cornfield first either by machine or by hand and then go over it again with a hand planter, planting the soybean hills as closely together as you prefer them. Do this directly after planting corn. Don't let the corn get the start of the soybean.

The sixth method of planting is to plant the seed corn with a two-horse

corn planter using the regular feed cups for planting. The soybean seed can either be mixed with the fertilizer in the correct proportion if no inoculated soil is to be sown, or mixed with the inoculated soil in correct proportions if no fertilizer is to be sown. If it is desired to mix fertilizer and inoculated soil together as many of our customers did in the spring of 1913, then we advise our customers to use some form of non-acidulated fertilizer, such as bone or basic slag phosphate. For example; if you intend to use 100 pounds of steamed bone, 100 lbs. of inoculated soil, and 8 quarts of soybean seed per acre, then mix all together very evenly and run the mixture through the fertilizer feed cups while corn is being planted through seed grain boxes. The dry fertilizer will help the soil to go through cups more easily.

It is very advisable that the soys be inoculated. On good soil, the uninoculated soys will grow apparently as well as those which are inoculated but it will be at the expense of the soil's supply of nitrogen.

If soys are planted with the corn it is even more important that they be inoculated so that they will help and not hinder the growth of the corn plants; not to speak of the good which will come to the following crop.

Don't plant your soys and corn while ground is cold. Don't plant over one or one and one-half inches deep. Be sure to inoculate. Soybeans can be inoculated with soybean bacteria only. No other legume's bacteria will do it.

Buy your seed and soil from us. Get the best and start right.

## SOYBEANS FOR HAY

Many feeding experts, especially well posted on corn silage use, claim and perhaps wisely so that every farmer should either grow or purchase a plentiful supply of high protein analyzing hay, to feed to ensilage-fed live stock.

Ensilage-fed cattle seem to crave some dry feed and the high protein hay not only helps to satisfy this natural craving but also furnishes one of the cheapest best ways of balancing up the stock ration. Corn silage is very low in protein, so the hay fed to cattle should be very high in protein if possible.

There is no high protein hay crop which comes so near to being a sure one as the soybean hay crop. We have never known any man to have a failure of a soybean hay crop who made any fair attempt to get one, but we have known many men making absolute failures at times in trying for clover and alfalfa hay crops.

We would advise that the soybeans be allowed to grow until pods are well formed. Then cut them and let them lay in the swathe as long as one dares to wait before leaves begin to shatter.

Then rake up and bunch them in moderate sized cocks and let them stand until cured. If it rains very much during the curing period, turn the bunches upside down occasionally, so that hay exposed to wet ground will have a chance to dry and not get moldy. Don't do any unnecessary worrying about your soybean hay spoiling in wet weather. We believe that soybean hay will endure more wet weather without loss than any other kind of hay. Even if some of it gets badly bleached live stock seem to like it very much anyhow.

Use same amount of seed per acre and same method in growing as one does when growing them for ensilage. A good crop should give from two to four tons of hay per acre.

## THE SOYBEAN AND THE NITROGEN PROBLEM

We have spoken in a general way of the soybean crop as furnishing a solution to the problem of finding a cheap source of protein feed for live stock. Now it furnishes just about as well the answer to questions as to where to find cheap nitrogen.

The cheapest and perhaps the best form in which to buy nitrogen in the fertilizer sack, is nitrate of soda. In that form nitrogen is worth 15 to 20 cents per pound. Since phosphoric acid can be bought for 4 to 5 cents per pound and if some soils need purchased potassium, it can be bought for the same price, it is very important to look after the most expensive element, nitrogen.



The scientific, practical, or common sense way to add nitrogen to our soils is to do it in Nature's own way and that is by propagating in our soils the abundant growth of nitrogen-fixing bacteria belonging to the different kinds of legumes. Soybean culture furnishes the nitrogen so very necessary for plant growth, free of charge.

Winter vetch does well under some conditions, and so does alfalfa, if conditions, some of them very expensive, are fully met. Clover will do well if we have enough lime, phosphorus and humus, but we believe that the soybean will produce some kind of a crop, if inoculated, on any kind of soil, no matter how poor it is.

Another great advantage it has over the other crops we mentioned is that it is harvested and the land is improved the same year as grown. With the renting farmer this is much more important than with one who owns and farms his land. The renter must make his living the same year he plants the crop. There would be an inducement to grow soys, because there would be returns the same year, but many tenants never sow clover because they think that they will not be there to harvest it.

Rented farms as a rule are not noted as being very successful clover farms.

Other things being equal we believe that the soybean comes the nearest to filling the bill correctly, for a profitable, easy growing, early maturing leguminous crop of any. We have seen them grown successfully on every kind of soil in this section. Can this be said truthfully of clover or alfalfa?

Planted after all the other crops are put out in the spring, ordinarily the early maturing varieties may be harvested and the ground put to wheat in good season, without any more plowing, the summer cultivation of the soys furnishing almost a perfect seed bed for wheat.

The soybean bacteria under good conditions are tremendous multipliers. One hundred pounds of good soybean-bacteria-inoculated soil will inoculate well an acre of soys if the soil is sifted and run through the three cups in the fertilizer box of the grain drill corresponding to the three feed hoppers used in sowing the grain; since we advise in practically all cases planting soybeans in rows 28 inches apart, using middle and outside hoes of a 9 hoe drill and cultivating the soys once in the row with a one horse cultivator a few times during the growing season. Under favorable conditions in three to four weeks from time that earliest cultivation is begun they will be too large for cultivation.

We sell soybean bacteria soil from one of our fields, which is wonderfully well inoculated, for inoculating this crop. This field so far as we have seen in many years has never grown any such foul weeds as white daisies, buck-horn plantain, Canada thistle, quack grass or anything of that order, so you won't run much risk of importing new weed seed from us.

The question is often asked us by practical, level headed farmers, "How much nitrogen will the nitrogen-fixing bacteria on the soybean roots take from the air in one season?"

In a carefully conducted test by Dr. Wheeler, of Rhode Island Experiment Station, lasting 5 years, the following results were obtained by growing inoculated soybeans in certain sizes of plats, the soils of which were analyzed at the beginning and the end of the five years' experiment and the yields by the acre computed from this test.

No. of plot	Pounds of nitrogen per acre in soil and seed at the start	Pounds of nitrogen per acre removed in the five crops taken off	Pounds of nitrogen per acre in soil after five years
1	3698	1313	4908
2	3602	1317	4777
3	3602	1373	4783
4	3673	1355	4810

If the nitrogen gained per acre in soil and crops was valued at the same price per pound as the nitrogen in nitrate of soda or any other good fertilizer the average gain in nitrogen would figure at about \$75.00 per acre per year, so if we cut down the value of this nitrogen gained to only 3 cents per pound we have even then a gain of \$15.00 per acre each year.

In a corn, soybeans, wheat, clover rotation or a corn, soybeans, oats,

clover rotation we have two very good soil builders to offset two nitrogen robbing crops. In the common corn, oats, wheat, clover, timothy rotation, we have only one builder to four soil robbing crops.

Since the soybean is the easiest of all the legumes to grow and the surest of all to do well (if they are given fair treatment) we know that their culture will prove to be of tremendous value to American farmers if we consider the benefits to the soil alone.

## GROWING A CROP OF SOYS

Soybeans can be grown on almost any kind of soil in the eastern part of the United States that will grow any kind of cultivated crop, but we want our seed to go to farmers who like to do the best they know how to do when growing a crop.

Now to put the directions in the fewest possible words we would advise you to plant them on the richest field you have preferably one which was in corn last year and then spread on all the fine ground limestone you can afford after the ground is plowed in early spring and then before planting after ground is well fitted, broadcast or put in with a drill several hundred pounds of acid phosphate steamed bone, or basic slag per acre.

Prepare a fine deep seed bed for planting and in drilling soys be sure to drill them, if possible, not over 1 or 1½ inches in depth. We advise that if you can secure good soybean-bacteria-inoculated soil that you drill it in with the soys when you plant them, using the middle and two outside seed hoppers of a 9-hoed drill for the seed and the corresponding hoppers in fertilizer box for drilling in the inoculated soil. Do not plant until ground gets well warmed up, from May 15th to July.

Cultivate the soys with a one horse cultivator once in a row just as early as they can be cultivated without covering them. Cultivate once a week or every 10 days.

If soil and other conditions are favorable, they will make such a very rapid vigorous growth that it will not be possible to cultivate more than four times, possibly only three times, on account of tramping the soybean plants with the horses.

Harvest the soys with either an old fashioned reaper, a binder, or mower with either a wind-rowing attachment or else a platform, fastened to back of cutter-bar on which the plants will fall back, when cutting two rows. This platform with a little help does the best work of any machine we know of so far in harvesting. This platform we made of just one full sheet of galvanized iron, costing \$1.35. The platform has a board railing around it to keep soys from falling off until a good big heavy fork full is gathered. Practically all the seed shelled in cutting the soys is caught on this platform and saved.

We thresh our soys with a common separator using one blank concave. If the soys are pulled by hand, there will be quite a lot of dirt stirred up in threshing, but it does not seem to be at all poisonous like the dust from threshing grain, especially oats.

In storing the seed be sure that it does not heat up or the germination will be much injured, perhaps all ruined. If not well dried out at threshing time, they should be spread out and shoveled over until dry, or else stored in sacks, a bushel per sack so they can be moved easily and have plenty of ventilation.

**The best time in which to have soybean seed shipped is during cold winter weather.** The germ life of soybean seed does not seem to be at all injured by exposure to low temperature.

We have known soybean pods to lay out on the ground all winter long and when spring frosts had buried them in the soil, the seed would sprout and grow very readily. What small loss in germination we have ever had in soybean seed, has been caused by either heating or molding in warm muggy or damp deather.

The most likely place of all for soybean seed to be injured in germination is in tightly packed freight cars during a long railroad trip.

Yet in all the years we have shipped soybean seed all over New York State, for instance, up to and including 1914, we have never received even one complaint from customers about germination of our seed.

We don't know how long we can keep up such a clean record but if our customers will order their soybean seed early in the winter it will help us very much to give nearly perfect satisfaction to them.

## SOYBEAN VARIETIES

In the descriptions we give of the varieties of soybean seed that we grow and sell, you may find some statements contrary to what other seedsmen have to say about them. As a general proposition those seedmen who sell soybean seed but do not grow it know but very little of the merits or demerits of the different varieties.

There is such a very remarkable difference in the growth and characteristics of the different varieties of soybeans that the only reliable course for a non-posted farmer to follow who wishes to grow soys for some particular purpose, is to purchase his seed from a reliable farmer seedman, who grows his seed and knows them as he knows his horses and cattle.

His harvest will very likely be satisfactory, very much so, if he has done his own part well, because the seed he gets will be just suited to his needs. But it will be nothing uncommon, if the seed that he buys from some city seedman will turn to be of a variety fitted for some other purpose than the one for which he intended it.

One of the most common of these mistakes made by city seedsmen, jack-of-all-trades on about 2,000 kinds of seeds is, to sell a farmer some southern grown variety of soys as seed for a northern grown seed crop. That mistake nearly always means absolute failure.

Buy your soybean seed from men who are the best informed men in that kind of seed.

### STONE'S ROOSEVELT SOYBEAN

This variety of soys, we introduced to the seed trade of 1912 as a very satisfactory general-purpose soybean, good for hay, very excellent in every way as a grain producer. Every year since has added to its good reputation with men who have the pure seed. In 1911 we grew 30 bushels of very fine Roosevelt soys per acre, and it has done as well as we could ask, considering the seasons, every year since. Many of our customers have grown from 32 to 40 bushels of these soys per acre.

Stone's Roosevelt soy has the following good points: It is early-maturing, grows very erect and stiff-stemmed, regardless of its height, is one of the heaviest of grain yielders, and shatters out but little when it is harvested. The seed is small and consequently not so much is needed per acre for a full seeding as is needed with large seeded varieties. Very few seeds are cracked in threshing them and we believe that the plants themselves have more natural vitality than those of any other variety we have seen.

As a good all-around soybean they have become so popular that unscrupulous seedsmen have foisted thousands of bushels of Mammoth Yellow, Medium Yellow, Ito San and other varieties of soys on the farmers of America as Stone's Roosevelt Soys in order to make the sale. One of the most prominent agricultural authorities in Ohio thought the Roosevelt soy was a fake, until he found out after a personal exchange of views



Stone's Roosevelt Soys.



that the variety which he had bought and tried out as the Roosevelt, was the old Mammoth Yellow Soy. No wonder that he had been so sure that the Roosevelt would not ripen seed in Ohio. A fair trial of the genuine Stone's Roosevelt seed, procured directly from us, convinced him of their value as a very prolific and early-maturing soy.

There is only one place where you can be sure of getting Stone's Roosevelt Soybean seed and that is from Stone's seed farm at Atwater, Ohio.

### THE MEDIUM GREEN OR GUELPH SOYBEAN

The Medium Green or Guelph Soybean is one of the oldest well-known soys in the U. S.

It is an old stand-by at the northern state experimental stations as a general purpose grain and forage growing crop. It is a good grain yielder. In 1911, Wooster Experiment Station raised 33 bushels per acre. We have had it grow in good soil, over 3½ feet high. It ripens medium early and if sown about June 20th in our latitude is about right to harvest for ensilage when corn is ready to cut for same purpose. Farther north where much earlier maturing corn, like Pride of the North corn, for example, is used for ensilage. Medium Green soys are mixed with the seed corn and they are planted, cultivated, harvested and put in the silo together.

We have received from some of our old customers wonderful reports of the effects on milk flow of feeding this mixed soybean and corn silage as compared with straight corn silage. We wish to recommend it as a good soybean to plant on very poor soil. In 1913 we raised 15 bushels to the acre of them on a large field, one of those poor, run down fields at which practically every man in the neighborhood has taken his turn at crop robbing. This in spite of a very backward summer and planting delayed until nearly July. It has medium to large size green seed.

We are giving in this book an illustration of our field of Medium Green Soybeans grown in the great drouth of 1914.



Specimen plants of Medium Green Soybeans, pods all ripe.

### PEKING SOYBEAN

The Peking Soybean is a small black-seeded soybean, but the soybean plants grow very tall and very erect, making them almost ideal for harvest-

ing with machinery. The plants bear a great multitude of pods, but on account of the seeds being so small, this variety cannot compare with our Stone's Roosevelt Soy as a grain producer, nor with the Ohio 7455 Soy either. But for the production of fine quality soybean hay, the Peking is much superior to the great majority of soybeans. Planting Peking Soys thickly does not seem to weaken the stems practically any, but produces very tall slender stemmed plants, practically ideal for green forage or hay production. They are much later in maturing than are our Roosevelt soys. Northern Ohio acclimated seed is consequently very scarce except in very favorable years. In fact Peking Soybeans are about the hardest to find in quantity and the easiest to dispose of.



Specimen plants of Peking Soybeans, showing the tall fine stems and abundance of pods.

#### OHIO 7455 SOYBEAN

This variety is a pedigreed strain of Medium Early Brown Soy, bred by Prof. C. G. Williams, Chief of Agronomy of Ohio Agricultural Experiment Station and member of the Ohio Agricultural Commission. This soybean has given us a yield of 37 bushels per acre in experimental plot and over 30 bushels per acre under field conditions with not a fair stand. It shatters out but little when ripe and splits up very little when threshed out by common grain separator. We like it better than any of the other pedigreed strains of soybeans, bred by Prof. C. G. Williams which we have tried out so far. In a fair test we believe this soybean will outyield any other variety in Ohio with the possible exception of Ohio 9035 Soybean, which is another soybean bred by Prof. Williams we understand, from the same original stock of Medium Early Brown Soys.

Ohio 7455 and Ohio 9035 Soybeans, which seem to resemble each other in all important particulars, take about a week more time in which to properly mature than does the Medium Green Soy.



Specimen plants of Ohio 7455 pedigreed soybean, one pulled before ripening and the other pulled when thoroughly ripe. Notice the plentiful supply of large pods. This is one of the best grain yielding soybeans in America.

### STONE'S ENSILAGE SOYBEAN

This variety of soys is a tall growing one, which we have tried out for several years on different farms to test its special value. We have been selling these soys to be used especially for growing in the same fields with corn for ensilage where the Medium Green Soy would mature too early for the corn. Those who have grown them for this purpose have told us that these soys please them very well. This year we will now advise our customers in Northern Ohio who want to grow soys and corn together for ensilage, the same way it is done on thousands of farms farther north, to grow Stone's Ensilage Soys. The seed of this variety does not germinate so quickly as that of some others but the variety is full of vigor and vitality and will stand very adverse weather and yet make a crop.

Under favorable conditions it will grow very tall. We have measured many plants from 5 to 6 feet long. Order seed early, because they will fill a long-felt want and be good sellers.

### MAMMOTH YELLOW SOYBEAN

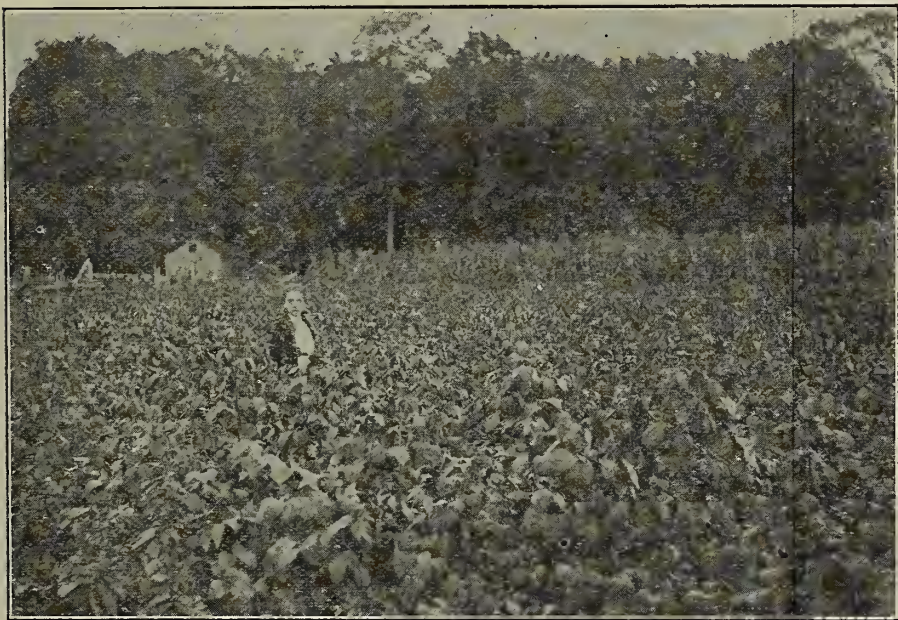
Mammoth Yellow Soys are about the latest maturing of all the many varieties of soybeans grown in America. They require a very long season in which to mature a seed crop, so that the seed must be grown in the South where it can have the climate necessary for full growth. These soys are very suitable, when one wishes to raise a great tonnage of green forage, 3 to 5 or more feet high, for use either as hay, ensilage, green manure or cover crop. But we have never known of its ripening seed in Ohio, except possibly in the extreme southern part of the State. Fine crops, yielding 20 to 35 bushels of large beautiful golden yellow seed per acre, are grown



of this variety in the Southern States. On account of its being one of the great staple crops in parts of Virginia, North Carolina and Tennessee, because of its great benefits to the soil and the profits of growing it, the seed has become much cheaper than that any other variety. This explains why this variety is handled by nearly all city seedsmen; the wholesale cost price is low and the seed can be sold cheaper than other varieties and yet the profits will be larger.

But this variety of soys while very well adapted to the South, is not adapted to conditions in the North except under favorable weather conditions. In a cold backward summer, we have seen the very smallest of Northern Ohio acclimated varieties of soys grow right away from the Mammoth Yellow Soys, which looked as if they were thoroughly discouraged with life in the North.

For average conditions on Northern farms it will be found that the Northern Ohio grown soybean seed is really the cheapest and in every way the most satisfactory seed to buy and plant.



A growing field of Stone's Ensilage Soys on Lone Elm Farm, Atwater, O.

## THE AGRICULTURAL LIME CAMPAIGN IN OHIO

If the farms of the eastern half of Ohio as well as those in all or in large sections of other neighboring states are going to do their share towards supporting the coming population of the United States it is very self-evident to the best posted authorities in agricultural matters that these farms must be given large quantities of agricultural lime in the near future.

Thus far the practice of making heavy applications of agricultural lime to the soils in the northeastern part of the United States is only in its infancy. But how wonderfully fast is the infant growing, almost faster in fact that the great agricultural lime plants of America have been able to satisfy his food wants! The great majority of farmers have not yet begun to realize how absolutely necessary to successful agriculture, in the fullest sense of the word, is an abundance of fine carbonate of lime in the soil.

Nature gave to most of the soils of Ohio a fair supply of lime for the maintaining of fertility under natural forest and pasture conditions, but

the natural supply furnished to the soils of the eastern part of Ohio was so much less than that given to the western part of the State that here in the eastern part is where we naturally expect the shortage and the shortage has come. Many have not yet been able to notice it but it shows up very plainly all over this part of the State to all observant farmers.

Where one Ohio farmer used agricultural lime ten years ago, ten to twenty farmers are using it liberally now! Where one ton of agricultural lime is used this year in Ohio, ten to twenty tons will be needed to supply the demand in five years from now!

One of the world's greatest authorities on the subject of soils and the man most respected by the farmers of Ohio described the condition of our soils very plainly, when a few years ago he made the statement that IT WOULD BE A GOOD THING FOR THE SOILS OF EASTERN OHIO IF THEY WERE GIVEN A TOP-DRESSING OF FINE GROUND LIMESTONE AN INCH THICK!



The beginning of a more profitable system of agriculture on a Portage County farm. A farmer's first load of Kelley Island Ground Hydrated Lime. An increased wheat crop, clover crop and corn crop will follow this first step. Perhaps he would have had no clover crop at all if he had not used this lime.

No one subject, in lime-depleted sections, now occupies such a prominent place in the discussion of farm practices in soil improvement as does the subject of liming. Every agricultural authority of any prominence now advocates more or less strongly the use of agricultural lime on the large majority of farms in the north central and New England States.

Five years ago only a comparatively small proportion of writers for farm papers openly claimed that fine ground limestone would be very effective as a corrector of soil acidity. Now nearly all of the leading farm experts advise the use of ground limestone just as quickly as they do the use of the ground lime itself for improvement of soil conditions.



It was Dr. Chas. E. Thorne who advised us five years ago to give our fields an application of either one ton of ground lime on two tons of ground limestone per acre and he told us then and later of the remarkable increases in crops which they were getting at Wooster Experiment Station after they applied large amounts of Kelley Island ground lime or ground limestone per acre.

Read his bulletin, No. 279. It tells of the wonderful results achieved from the investment.

We purchased our first carload of fine ground limestone from the Kelley Island Lime and Transport Company in the spring of 1910 and gave our corn ground a heavy application of this material. The first carload we used gave very paying results and so also has all the lime we have purchased from them since that time. In the fall of 1910 we first began to sell their agricultural lime in this section. Up to this time so far as we could ever find out, seventy-five to one hundred tons of agricultural lime was about the maximum amount ever purchased by farmers in this section in any one selling season. We perceived at once, however, that there was going to be an enormous demand for agricultural lime inside of a few years; if we could only get the farmers themselves to prove to their own satisfaction the need of it on their own farms. This took a great deal of missionary work on our part to get men to give the Kelley Island agricultural lime a fair trial. To many men we sold only very small quantities at first for experimental work. But the demand kept on growing. We handled the very best quality of agricultural lime in Ohio and were willing to sell it at a very close margin of profit and that "started the ball to rolling."

Only four years have passed since we made our first sale of Kelley Island lime here. Just see how the demand for lime has developed since that time. We would judge, roughly estimating the amount, that about 2,000 tons of agricultural lime and limestone were unloaded this past fall at the few little railroad stations near here, where less than 100 tons of agricultural lime was sold in one season a few years previously at the same points.

For five years we have been buying and using Kelley Island lime both for our own farms and for our customers as well. During all that time the men in charge of this great lime company's business management have treated us with every courtesy and consideration. In all that length of time we have never had even one complaint about quality of any material we have purchased from them, either ground lime or ground limestone.

Each season has brought to us a large increase in business over the previous one and the increased number of orders we have forwarded to them have, in the "rush order" seasons, exceeded their capacity. But whether it was during a busy season or during a slack one, we have always received from them as fair treatment as we could reasonably expect. The sales manager and traffic manager of a great agricultural lime company certainly have a long list of problems and annoyances to worry and aggravate them during the fall months, because the great majority of farmers still make a practice of ordering all their lime for delivery during one month of the year; that is from about Aug. 15th to Sept. 15th.

Perhaps our customers can imagine, partially at least, what a lot of trouble it causes the officers of the lime company to have nearly all the orders received by it specify about the same date for shipment of cars. In our business dealings with the sales managers of the Kelley Island Lime and Transport Co., we have found that they try to do what is right in handling their orders, but they cannot do justice to their customers, if all persist in ordering their lime at the same time.

It was our pleasure to be escorted through the immense agricultural hydrated lime and ground limestone plants of the Kelley Island Company by the general superintendent and the traffic manager, both experts in their chosen lines of work, fine, friendly, whole-souled men who are trying not only to do faithful work for the Company but also to give the best service possible to its customers. We as customers should try, on our part, to help them make things go with as little friction as possible by ordering our agricultural lime, if we can do so during the slack seasons of the year, the winter and summer months.

The Kelley Island Company will have enormous additions to their agri-



cultural lime plants completed before our 1915 catalogues reach our customers, so they will be prepared to give better service in 1915 than they have been able to do in the past. If interested in the agricultural lime campaign write to the **Kelley Island Lime and Transport Co., 101 Leader Bldg., Cleveland, O.,** for their new catalogue.

## AN ABUNDANT SUPPLY OF LIME IN THE SOIL IS AN ABSOLUTE ESSENTIAL TO SUCCESS- FUL AGRICULTURE

### LIME IMPROVES MECHANICAL CONDITION OF SOILS

If you have a very tough tenacious clay soil and you apply plenty of ground limestone to it you will help very much the physical condition of the soil. It will tend to make it friable and much more easily worked and cared for and give it more of the character of a sandy soil. On the contrary if one applies lime to a sandy soil it helps to correct the short comings of such a soil. The lime seems to bind the particles of soil together and tends to give it more of the good qualities of a clay loam soil. It will hold moisture much better and we believe it will not allow the valuable plant foods to be leached out so easily during wet weather. If you have an old garden spot or a truck patch on a clay loam soil you will likely acknowledge that after farming it for a number of years your soil has become hard to keep in nice condition even after yearly applications of manure. Now try a very heavy application of fine ground limestone on your truck patch and garden and note the pleasant results you will get from its use inside of a year or two. We have seen some remarkable changes made in some farmer's gardens by the use of only fifty cents worth of lime. Try it yourself next spring.

### LIME IS A PLANT FOOD

In the case of some plants we find that lime or properly speaking carbonate of lime is a plant food. Take alfalfa for instance. Alfalfa is a great feeder on carbonate of lime. Look up the chemical composition of the alfalfa plant and you will perhaps be surprised to find out what a large proportion of it is carbonate of lime.

For years there has been a warm discussion going on between the users of lime and the agricultural scientists over the subject "Is Lime a Fertilizer?" Several firms who manufactured hydrated lime for agricultural use, put it up in paper bags and marked them Lime Fertilizer. Now farmers as a class have never objected so much to the name given by the manufacturers as they have to the exorbitant price asked for the lime by the salesmen.

Lime is a plant food, for just as surely as phosphorus, potassium, and nitrogen are necessary in the structure of plants so also are carbonates of calcium and magnesium. Carbonates of calcium and magnesium is the chemist's name for natural limestone or carbonate of lime. It is true of course that the majority of plants do not use but a very small proportion of lime in their growth, but they use it nevertheless, and some of them, especially legumes, use far more than others. Later on we will speak of lime as being a corrector of soil acidity, which is the principal reason for its use, but lime is of much value as a plant food as well. At the Wooster, O., Agricultural Experiment Station they found that a heavy application of either ground burnt lime or ground limestone corrected the soil acidity so that medium red clover grew very luxuriantly where it was almost a failure before liming. Nevertheless they were not able to get alfalfa to do well there at all until finally they doubled the application of lime to the land intended for alfalfa.

After that the alfalfa grew very well. Do practical farmers really care very much whether the alfalfa did well because the soil was sweeter or did well because alfalfa is a very large feeder on carbonate of lime and found a supply plentiful enough to suit it? As the man who was cured of blindness said to the Pharisees, **"THIS I KNOW. Whereas I was blind, now I see."**

Years ago when we began to use fine ground limestone in heavy applications to the soil on our farm, we wrote to Dr. Chas. E. Thorne, Director of

is that the particles of lime are more finely divided than in even fine ground limestone, but with this disadvantage. Neither caustic lime (calcium oxide) or hydrated lime (calcium hydroxide) can be of use until they change back to their original form of calcium carbonate or ground limestone.

As fast as the acids are formed in the soil, they are neutralized by the carbonate of lime or limestone in the soil. But nature did not treat all soils alike in furnishing them supplies of limestone. Some soils were only given a small supply which was soon used up in farming the land, while other soils were furnished an almost exhaustless supply of limestone. The soils in Eastern Ohio received only moderate supplies compared with the soils of Western Ohio. The farmers of this end of Ohio have been using up their supply of limestone for from 50 to 100 years, without putting but little if any back on the land. Do you know that the better you farm, the faster you use up your lime supply? Don't be alarmed about that, **because the game is worth far more in this case, at least, than the ammunition.**

Down at Wooster Station, a good many years ago, they analyzed the soil in one big experimental field to find as nearly as possible how much limestone per acre the soil contained. Since that time they have been farming those fields in the most practical up-to-date way that they know how to do. They first applied to the land, years ago, two tons of fine ground limestone per acre. They also give the fields in each 4 years rotation liberal application of fertilizer and moderate supplies of farm manure and one ton fine ground limestone per acre. From these specially-handled fields they are growing tremendous big crops and the yields are gradually increasing. This heavy cropping of the soil is giving highly profitable results above the cost of all lime and fertilizer applied to them. Although the bills for fertilizer and lime are large, the profits are very much larger.

**Recent analysis of the soil of these Experiment Station fields have shown that the heavy cropping and consequent rapid formation of soil acids are using up over two thousand pounds of ground limestone per acre, every four years!**

Furthermore, a leading authority there said that if limestone dust should be the limiting factor in crop production on these fields, the additional profits from its use would be so great, that if necessary they would apply **MORE THAN THE ONE TON PER ACRE**, every four years. Recently we heard that they were now applying two tons of fine ground limestone per acre in each rotation of crops.

### **LIME STIMULATES THE GROWTH AND MULTIPLICATION OF NITROGEN-FIXING BACTERIA**

Our farm soils if they are kept well supplied with humus and carbonate of lime are full of soil bacteria, of different kinds. These bacteria do the great work of preparing the food for different plants. They break up the different chemical compounds in the soil and get them into such forms that our plant roots can utilize them. Carbonate of lime and humus are the great agents for promoting soil bacterial growth so we should not only apply a plentiful supply of fine ground limestone, but also add lots of humus making material to our fields in the form of live-stock manures, and cover crops and other vegetable matter, all thoroughly worked into soil.

Under the head of Soil Bacteria Inoculation we have shown how absolutely necessary it is to successful farming, generally speaking, to raise legume crops on our soils, especially if they have been depleted by poor farming. **It is an absolute fact that the most of legume bacteria will not do well at all on acid soils.** It almost seems unbelievable that so few farmers, comparatively, in Eastern Ohio seem to recognize the fact and act accordingly.

The condition of your medium red clover crop is almost always a sure indication of your lime needs. The legume bacteria of medium red clover are present in our soils. If the soil is not acid and humus is in fair supply, the bacteria will multiply fast on the clover roots and your clover will thrive. If your soil has a fair supply of humus and the red clover does not do well, then get busy, buy a carload of our Kelley Island fine ground lime and **get into the game.**

### **LIME MAKES THE FARM CROPS RICHER IN PROTEIN**

Dr. T. N. Lyon of Cornell Experiment Station at Ithaca, New York, conducted a series of experiments there of wonderful value to American farmers. These experiments showed the wonderful effects of lime on alfalfa,

not only in increasing the yield of tons of hay per acre and increasing the percentage of pure alfalfa in this hay, but it even increased the percentage of protein in the alfalfa itself almost 30%. And analysis of one of the weeds growing in the alfalfa showed that its protein analysis had been increased, over 21%.

Liming the land in this case had increased the first crop of alfalfa hay over 37%. It had increased the proportionate amount of pure alfalfa in the hay over 16%. And most important of all it had increased the available nitrate plant food in the soil over 90%!

Verily lime in respect to plant life is "Sauce for the Gander, the Goose and the Goslings."

### LIME DESTROYS MANY PLANT DISEASES

A heavy application of Kelley Island Agricultural Ground Lime or Limestone is almost a sure cure in every case of such root diseases as "club foot" of cabbage and many diseases of turnips, beets and other root crops.



Field of mixed medium clover, alsike clover, alfalfa and timothy hay on Lone Elm Farm, following two years after a crop of Medium Green soybeans, limed with Kelley Island ground limestone.

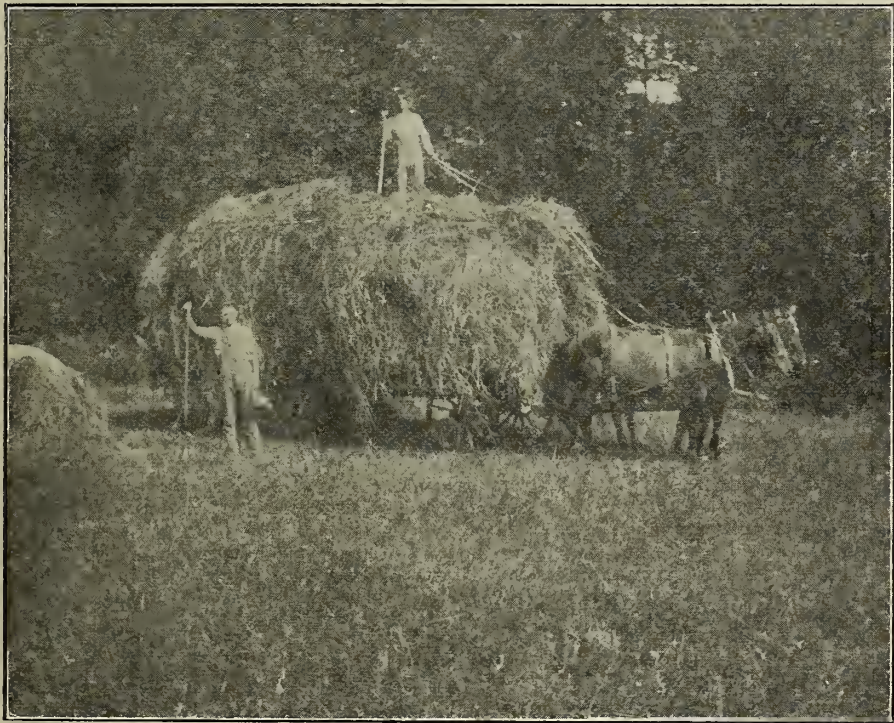
### WONDERFUL RESULTS OBTAINED FROM THE USE OF AGRICULTURAL LIME

Some of our customers have tried various ways of testing it out on their fields. Whenever they left unlimed strips the difference in clover growth between the limed and unlimed strips was oftentimes, the difference between success and absolute failure. A few made the mistake of using a very light application of only a few hundred pounds per acre. While some of our cus-



tomers use only one-half ton ground limestone per acre each rotation, the most of them are now using one ton per acre and the most farsighted ones are using two tons per acre. In tests which we have made on our own farm, we found that (for the first application at least) we secured as much profit from using the second ton of ground limestone per acre as we did from the first ton per acre. One of our customers, who uses ground limestone, two tons per acre each rotation harvested in 1913 season from ten acres of meadow, forty big loads of hay.

We are illustrating in our catalogue two views taken in our 1913 meadow. This field previous to liming had very seldom produced big crops. The first year we limed it we grew a big crop of corn, the following year the big crop of Medium Green soybeans, illustrated in 1914 catalogue. The following spring, a very wet one, we disked up the soybean stubble, and well along in May sowed a bushel and one peck of Big Four oats per acre, seeding at the same time a mixture of medium red clover, alsike clover, timothy and alfalfa. The lime and soybean treatment produced a 50 bushel crop of oats per acre and a beautiful grass catch.



It only required from sixteen to eighteen cocks of hay to make such a load as the above one on a hay rigging eight feet wide and sixteen feet long.

We were sorry that we had no farm scales at the time on which to weigh the hay which was hauled from that meadow. The reader may get some idea of the crop when we say that it took only sixteen to eighteen of those cocks of hay shown in the one illustration to make a load of hay like the one shown in the other. Our hay rigging is eight feet wide by sixteen long. The alfalfa grew just as thrifty if not more so in this field than ever alsike clover grew there, before we limed it.

The 1914 crop of Stone's Pedigreed Calico Corn which we grew in this

field is a very good mate for the preceding crops we have had there since we first began to give it liberal applications of Kelley Island fine ground limestone. Alfalfa plants were scattered fairly even all over this field when we plowed it for corn and we believe that plowing under this alfalfa made quite an additional gain over the timothy sod in corn production. But the credit belongs mostly to the Kelley Island Ground Limestone which made the alfalfa thrive.

All the fields of soybeans and the corn fields as well, which are illustrated in this catalogue have received in the past few years good applications of Kelley Island Ground Limestone. The investment in this material has been one of the best ones we have ever made.

Leading farmers all over the country are now taking up the business of liming their land, mainly to get the profits from raising big crops of legumes.

Every year adds a big army of recruits to this enterprise. One can almost judge the zeal and enterprise of the farmers of any section of Eastern Ohio by their lime purchases. We now sell a carload of Kelley Island Lime more easily than we used to sell a ton.

While it is perhaps true that Atwater, O., has become almost as well known for her soybeans as is Boston for her baked beans, we take more pride, as citizens, in the record she is making in the use of lime. We believe more agricultural limestone is unloaded here than at any other R. R. station in Northeastern Ohio and are glad of the part we have taken in introducing it and encouraging such a large consumption.

If interested in agricultural lime write to the **Kelley Island Lime and Transport Company, 101 Leader Bldg., Cleveland, Ohio**, for a booklet on the subject. You will find the officers of this company are very courteous and reasonable in all of their dealings with their customers. That at least has been our experience with them, lasting through a number of years.

## FORMS OF AGRICULTURAL LIME

There is about the same amount of lime in either 100 pounds of ground limestone, 74 lbs. of ground hydrated lime, 56 pounds of ground caustic or lump lime, or 100 lbs. of air slaked lime.

### KELLEY ISLAND GROUND HYDRATED LIME

This past fall we saw many things of great interest to us in our trip to the famous Kelley Island Lime & Transport Co.'s great agricultural lime plants at Marblehead, O., to see how the lime was manufactured for the use of American farmers. The management of the Company has got the agricultural hydrated lime business studied out almost to perfection. When their burnt lime, which is drawn out every few hours from each of a battery of great high lime kilns, which work on a continuous output plan, is slaked into hydrated lime, just exactly enough water is used for the purpose to slake it into a fine, fluffy, pure white powder. Yet even that material is run through a grinding machine to grind it finer. Do not try to sow our Kelley Island ground hydrated lime on a windy day or a lot of it will blow away as if it were gas or steam. This lime is certainly put up in the finest possible shape to give the quickest results for agricultural use. Ground hydrated lime is put up in paper sacks weighing 40 lbs. each. Being perfectly slaked it will keep indefinitely without losing any value, or destroying the sacks. We especially recommend it to customers who have very long or difficult hauls to make or who want lime which can be very conveniently stored.

### KELLEY ISLAND GROUND CAUSTIC LIME

Ground caustic lime is richer in lime of course than the hydrated lime, which always takes up a certain percentage of water in the course of manufacture. Ground caustic lime, however, though it is richer is also objectionable to use. Kelley Island ground caustic lime is very rich in lime, which means it is very caustic in action. Consequently if it is used at the rate of more than one ton per acre at each application it is going to break down or destroy a lot of good soil humus so necessary to a healthy crop-producing soil.

But it will at the same time make lots of trouble and pain for the men who handle it, especially if the spreading of it should be very much delayed



after date of manufacture. It will burn skin and eyes and nostrils just as well as humus if it gets a fair chance. The Kelley Island Company puts it up in paper sacks weighing about 75 lbs. each or in jute bags, weighing 140 lbs. each.

Do not delay using it after receipt of car for it is sure to burst the sacks if kept in them very long, for it begins at once to gradually take up moisture from the air and then swells until it finally bursts the sacks.

**When you buy your agricultural lime use the same judgment that you use in buying your fertilizers. In other words judge the value of your lime by its mechanical condition and its chemical analysis. Let us illustrate this point.**

Kelley Island Ground Caustic Lime analyzes in Ohio State Chemist's report 53.23% calcium oxide and 33.12 magnesium oxide. Since magnesium oxide is worth about one-sixth more than calcium oxide in correcting soil acidity, the total value of this lime would be about 91 or 92% calcium oxide. We know of another make of agricultural lime sold in Ohio whose value in calcium oxide as judged by Ohio State Chemist's tests is about 52% only. If the 52% lime is worth retailed \$6.25 per ton, then the Kelley Island caustic lime is worth at least \$10.90 per ton and the expense of hauling and spreading the poor lime would be the same as for the best. Yet the farmers who bought this low grade of lime paid as much for it as the farmers who bought the Kelley Island Lime in the same railroad yards.

No intelligent farmer would now let a fertilizer agent sell to him a 10% acid phosphate for the price of an 18% goods. Then why pay a lime agent the same price for a 52% lime as for a 91% lime. Not many men can afford to work with the poorest of farm tools, neither can they afford to use the poorest of lime.

Buy Kelley Island Agricultural Lime; the Best.

#### KELLEY ISLAND FINE GROUND LIMESTONE

This form of lime we have used ourselves and advocated to nearly all of our customers for years. Some customers live so far from the railroad stations that considering the cost of hauling and other expenses as well, the Kelley Island Ground Hydrated Lime is the best and cheapest form in which they can buy lime. But for the closer hauls we strongly recommend the above make of fine ground limestone, because it is just the kind of lime that nearly all of us need and ought to buy. Nearly every authority on soil chemistry in the United States now advocates the use of fine ground limestone of the highest analysis for the improvement of their verdict is the result of that experience in the use of many different forms of soil conditions. The great majority of these men have had a wide experience and agricultural lime.

Good limestone is composed almost altogether of carbonate of calcium and carbonate of magnesium. Carbonate of calcium is often called carbonate of lime but a little study of the analyses of all the different kinds of agricultural limestone sold in Ohio will show that they all contain more or less carbonate of magnesium. The latter compound is worth more for correcting soil acidity than is carbonate of calcium. To be exact: 34 pounds of carbonate of magnesium has about the same value as 100 pounds of carbonate of calcium. The official state analysis of Kelley Island Ground Limestone by the Ohio State chemist for 1913, showed that it contained 77.24% carbonate of calcium and 18.77% carbonate of magnesium. The 18.77% carbonate of magnesium would be equal to about 22.34% carbonate of calcium. This added to the 77.24% would give the value of a limestone analyzing 99.58% carbonate of lime.

Several makes of ground limestone sold by Ohio firms have a total value of about 85% or 86% carbonate of lime only. The Ohio chemists' report will show this to be true. It is therefore very evident that if these low-analyzing grades of ground limestone cost \$3.00 per ton delivered on the farm, then Kelley Island Ground Limestone will be worth over  $\frac{1}{2}$  more than that or about \$3.60 per ton. Does any farmer want to apply low grade lime to his farm when he can buy the best grade for but very little more money.



## BACTERIAL INOCULATION OF LEGUMES

A plant on whose roots a certain kind of bacteria will thrive, which kind of bacteria has the function of drawing nitrogen from the air and storing it up on its roots in the form of nitrates is commonly called a legume. There are about thirty well known legumes, besides perhaps hundreds of other kinds of legumes not so well known. The best known legumes are alfalfa, sweet clover, medium red clover, mammoth red clover, alsike clover, crimson clover, white clover, soybeans, cowpeas, Canada field peas, winter vetch, spring vetch, etc.



Alfalfa plant less than one year old, showing the wonderful bacterial growth of nodules on the roots, the result of using Mulford's Nitro-Germ for alfalfa.

Such a large amount of nodules are developed on the enormous root growth of alfalfa that at least 40% of the fertilizer value of the whole plant is in the soil in the root system, after the crop is harvested. Is it any wonder that alfalfa, well inoculated, is such a wonderful soil builder?

Now with the exception of sweet clover and alfalfa which allow the same bacteria to inoculate their roots, **EACH KIND OF LEGUME TAKES ITS OWN KIND OF BACTERIA TO INOCULATE ITS ROOTS AND NO OTHER KIND WILL DO IT.** Always bear that in mind. You can't inoculate your soybean roots with cowpea bacteria nor your winter vetch roots with red clover bacteria. The bacteria are different just as the plants themselves show a difference.

We have so many questions asked us in our seed correspondence about the life, habits, and other matters connected with the bacteria which sometimes make their home on the roots of legume plants that we will use some space here to explain some things in connection with the subject.

Very few soils contain the bacteria necessary for the inoculation of many legumes, that wonderful family of plants which are nature's great assistants in building up impoverished soils or improving good ones. Generally speaking most of our cultivated land in this part of the United States is inoculated with the bacteria which thrive on the different common clover plants, but that is about all with the possible exception of garden peas and beans.

A legume crop is, generally speaking, one which contains an unusually large proportion of nitrogen in its composition compared with most of the other common crops. If the soil in which the seed is sown contains a very abundant supply of nitrogen available for plant food, the legume will be apt to thrive even if it should not be inoculated, but the growth of the crop will all be at the expense of the soil. If the soil is very deficient in nitrogen a legume crop will either be small or weakly or both.

Take the soybean crop for instance. It has been proven that not only will an inoculated soybean crop be larger than an uninoculated one, other conditions being the same, but the inoculated plants will also analyze considerably higher in protein than the uninoculated ones.

Nitrogen is the most expensive element of fertility that we have to purchase in the fertilizer sack, so it behooves us to study up the legumes and the subject of inoculation so as to cut the nitrogen bill from our fertilizer bill and at the same time build up our farms. **When you inoculate your legume crop you not only increase the value of your crop but help your soil even more so.** At the present prices of nitrogen in the form of nitrate of soda a three-ton crop of inoculated sweet clover hay would represent a gain of over \$19.00 drawn from the air without charges. A three-ton crop of inoculated soybean hay would represent a gain of over \$17.00, conservatively speaking; a like weight of inoculated medium red clover hay, \$14.00 net gain, a three-ton crop of inoculated mammoth clover hay, \$12.00, and a three-ton crop of inoculated cowpea hay, about \$10.00 gain. Winter vetch hay inoculated would rank as high comparatively as sweet clover hay ton for ton as a nitrogen gatherer. It certainly seems to us that no man of intelligence who once thoroughly understands these principles will fail to take advantage of them and get just all the gain he can get from the use of legumes in the rotation.

We are now working on what we think will be an improvement in our corn-soybeans-wheat-clover rotation and certainly hope that it will open up another grand opportunity to all of us to further improve our land at a little expense. In times past we have sown rye in our corn fields in order to use up what nitrates might become available during warm fall days in the cornfields and be lost, to protect the soil from erosion during winter and early spring, and to add a lot of humus to the soil when the crop was turned under.

Now we have started to grow winter vetch along with the rye and as soon as we get it, the vetch, inoculated on our soils, we will then have three legume crops growing in our four-year rotation, not to speak of the possibly immense addition to the soil's supply of humus, through plowing down a big crop of rich vetch mixed with rye as green manure. It sounds perhaps visionary to some men, who live in a Chinese-exclusion style of a farming district, but many men are doing such things nowadays and accomplishing modern wonders in a go-ahead-and-do-it gait. We can grow the clover; so can you. We can grow the soybeans; so can you. The winter vetch is growing in our corn stubble and we don't know why it won't grow in yours also if you do your part.

If our customers have the fields ready for the legumes, we can furnish them the agricultural lime with which to make them sweet and the first class seed of different legumes for planting. Now the last and one of the important points is to get

the legume roots inoculated. If you simply wish to grow clover in this part of the United States, you will hardly ever have to inoculate for the common clovers, because most of our soils have already been inoculated, by nature for many years. In many sections where sweet clover has grown for years the soils in the neighborhood is not only inoculated for that crop, but for alfalfa as well. But the northern part of the United States is not the native home for soybeans, cowpeas, and many other legumes, so if we wish them to do their best for us we **MUST** inoculate them.

**THE SOIL TRANSFER METHOD IS THE SUREST WAY TO INOCULATE A LEGUME CROP.** This means to take soil from a field well inoculated with bacteria of a certain kind of legume and sow this soil on some other field where one wishes to grow this legume. If the inoculated soil is protected from bright sunlight and is not allowed to become too dry before using it is practically sure to give results. We believe that some kinds of legume bacteria are perhaps not so hardy as others and will not stand so much bad handling in the soil transfer method.

When sowing inoculated soil of soybean bacteria on a field we aim to choose a cloudy day for the work and follow the work right up with a harrow if we are sowing the soil broadcast. But we have secured good results in inoculation even on a bright sunny day.

We are in position to furnish at present soil inoculated only with the nitrogen fixing bacteria belonging to soybeans, cowpeas and red and alsike clover. But we sell many kinds of legume seeds and every one of these legumes or pod bearing plants in order to develop a maximum crop and to improve the soil as nature intended they should must be inoculated with a special form of nitrogen-fixing bacterial life belonging to that legume.

In order that our customers may have the most up-to-date and complete equipment for the production of legumes, we have made arrangements with the world-wide-known H. K. Mulford Company of Philadelphia, the leaders in the production of all kinds of bacteriological preparations of the highest class, such as small pox vaccines, typhoid and diphtheria serums, and other like preparations used by all the best physicians in America to furnish us for the use of our customers liquid culture preparations of each different kind of nitrogen-fixing bacteria put up in one-acre and five-acre sized bottles ready for immediate use after receipt, for inoculating any legume crop which our customers may wish to plant.

If customer will send us the name of the legume crop which he wishes to inoculate we will sell to him a 1-acre sized bottle of the proper liquid bacterial culture for this legume for \$1.50 and a 5-acre sized bottle for \$5.00, thus reducing the cost of the essential culture to only \$1.00 per acre. By this method we may furnish our customers anywhere in America the very best and purest culture of any of the nitrogen-fixing legume bacteria at a very normal cost.

This liquid culture is put up in flint glass bottles with rubber stoppers and each bottle is put in special boxes which contain special explicit directions for the use of the culture. The directions are so simple and so easily understood that any bright boy or girl should easily be able to follow the directions for treating the seed. When our customers know that the liquid culture bacteria or Nitro-Germ which we sell to them is prepared and tested by the H. K. Mulford Company with the same degree of care they use in preparing diphtheria antitoxin and small pox vaccine and other wonderful helps to the human kind, it will give them the greatest of confidence in the result of their investment.

**An uninoculated legume crop is a soil robber like other non-legume crops,** while an inoculated legume crop is a great soil builder, so be sure to thoroughly inoculate the seed of your legume crops next spring by using either our inoculated soil or our H. K. Mulford Company's liquid bacterial culture.



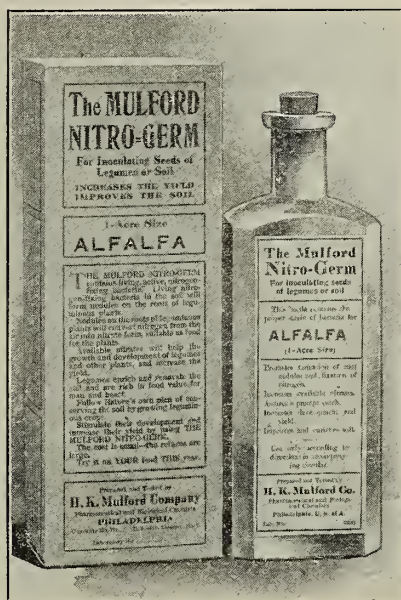
The Nitro Germ or liquid culture for alfalfa, crimson clover, sweet clover, white clover, red clover, alsike clover, cowpeas, soybeans, Canada field peas, peanuts, spring vetch, winter vetch, sweet peas, garden peas, garden beans and lima beans is always kept in stock for immediate shipment.

Nitro-germ for mammoth clover, burr clover, yellow clover, berseem clover, horse beans, velvet beans, perennial peas, lupins, sainfoin, beggar weed and many others will be prepared after receipt of order and shipped a few days later. If customer wishes the inoculation shipped to him by express or parcels post, he will have to pay the charges, but by sending us their orders for Nitro-Germ and legume seeds at the same time we can arrange to ship the Nitro-Germ with the seed and save our customers the parcels post or express charges.

This year we have for sale for the first time soil which is inoculated remarkably well not only with the soybean nitrogen-fixing bacteria but with the cowpea bacteria as well. Notice the good illustrations in this catalogue of inoculated soybean and cowpea roots, showing the remarkable development of tubercles or nodules. Both the cowpea and soybean roots in photos came from the above field. This field has had in the past years very liberal applications of the rich Kelley Island fine ground limestone to encourage a great bacterial growth and the illustrations show very well that we have them.

Since the soil we will sell this year is inoculated with both soybean and cowpea bacteria it is really worth twice as much to the customer; but we will sell it to him at the same price we have been asking in previous years for the soil inoculated for soybeans alone.

**Guarantee on Inoculated Soil.**—If any of our customers for soybean-cowpea bacteria-inoculated soil will furnish us next winter with satisfactory evidence that they did not get inoculation started on their soybean or cowpea roots after using our soil according to directions, we will duplicate their orders for soil again in the spring of 1916, free of charge, F. O. B. cars, Atwater, O.



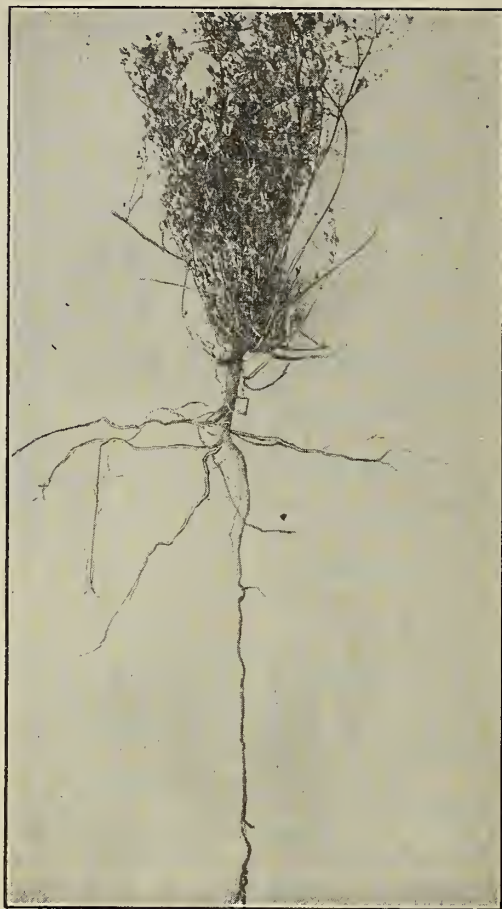
The way in which the H. K. Mulford's liquid culture of the bacteria belonging to different legumes is put up for our customers.

growth and the illustrations show

## ALFALFA

Perhaps no crop has ever been "boomed" in America as alfalfa has been. There have been so many good things said about alfalfa in the past that it is not necessary to say much about it to well read people. However, our catalogue travels all over the world among many nations and to some of them alfalfa is not a familiar crop.

For those who can grow alfalfa successfully, perhaps it is the greatest of all crops grown for stock feeding, but many farmers who grow it under conditions unfavorable to the plant, do not raise what we would call successful crops of alfalfa considering what would be the value of the other crops which would be fitted for those soils. Alfalfa does its best work in a good rich soil, which possesses first class natural underdrainage. Alfalfa will do well in clay loam soils which are thoroughly tile-drained, but the alfalfa will be always the best over or close to the tile drains. It is absolutely necessary that soil for alfalfa growing have a very liberal supply of fine ground limestone in its composition. Generally speaking, the average field in eastern Ohio should receive an application of at least three or four tons of fine ground limestone per acre.



Three-year-old alfalfa plant, whose root penetrated over four feet of hard clay subsoil. Notice the tremendous root system of just one plant. Alfalfa draws immense supplies of nitrogen from the air and large supplies of potash and phosphorus from the hard clay subsoil. Great is alfalfa. Inoculate it with H. K. Mulford Nitro-Germ and feed it plenty of Kelley Island Agricultural Lime.

A good application of phosphated stable manures should be plowed under in the spring and ground thoroughly prepared for seeding. Seeding may then be made with early oats or barley as a nurse crop, but we think the best stands are secured by deferring the seeding until some time in July right after a rain mellow and dampens the soil. Keep the field thoroughly harrowed from plowing until planting time, in order to hold the moisture, prepare a fine firm seed bed and germinate and kill out the weed and grass growth, whose presence would almost mean death to a successful alfalfa crop.

It is sometimes well to clip the first season's growth in the fall and allow it to lay as a mulch on the alfalfa. The following year one should watch the alfalfa and cut it for hay, each time as soon as little shoots begin to start up from the crowns to indicate that the new growth was starting.

Do not allow it to dry out before cocking it up to cure, because it is very apt to loose its fine leaves, if allowed to cure in the swath and will lose much if cured in the windrow. For peace of mind we advise all alfalfa and clover hay producers in sections where rains are prevalent in harvest season to supply themselves with muslin 40 by 40 inch hay caps. Then let it rain, if it is so inclined; one's religion is not apt to be tried so much.

It is a very good paying plan to give alfalfa fields a yearly broadcast application of about 500 pounds of either acid phosphate or basic slag and a ton of fine ground limestone per acre and a good top dressing of manure. With good treatment like this, alfalfa will produce three or four good crops per year for from four to fifteen years. The best purest alfalfa seed is the cheapest in the long run. Use from 15 to 25 pounds of seed per acre lightly harrowed in at planting time. Be sure to inoculate with either alfalfa inoculated soil or liquid culture bacteria of the H. K. Mulford Company.

Prof. P. G. Holden, one of the best posted alfalfa experts in the world, says that a splendid lot to choose for an alfalfa seeding is one from which a good clean crop of inoculated soybeans had been harvested the year before. One season's good cultivation for a corn crop, followed by another year's clean cultivation for a great nitrogen storing soybean crop, leaves a solid seed bed for alfalfa which should not be plowed at all but only needs to be cut up well on top with a disc harrow and other harrows at different times from spring up until time to sow the alfalfa seed in July. This means practically three successive years of clean cultivation before sowing the seed. If the corn ground has already received a good application of lime, we would recommend sowing at least two tons of Kelley Island fine ground limestone per acre on this soybean stubble in the spring before or after the first harrowing.

### INOCULATION

A very large share of the failures in growing alfalfa are due to lack of good inoculation. Inoculation is absolutely necessary for successive alfalfa culture. We are prepared to furnish our customers with the most reliable liquid culture inoculating material to be found in America. It is prepared for us by the H. K. Mulford Company who are known the world over as the leaders in the production of the very finest quality of all bacteriological products as well as liquid cultures for the different legumes. The soybean, cowpea, or clover inoculation in our soil will not inoculate the roots of your alfalfa plants at all, because each legume requires its own inoculation.

### SEED

The very best alfalfa seed which you can buy will be the cheapest for you in the long run. Cheap alfalfa seed is very liable to be old seed which contains bad weed seeds, one of the worst of which is alfalfa dodder.

If alfalfa dodder gets a fair start in an alfalfa field it will ruin it. **We handle just one grade of alfalfa seed and only one. That grade is the very best we can get.** Sow 15 to 20 pounds of best seed per acre for regular alfalfa seeding.

We strongly recommend to our customers that they sow from two to four pounds of alfalfa seed per acre, mixed with their clover seed at each regular seeding and keep it up each year. Eventually our customers will then not only find out on which parts of their cultivated land alfalfa will thrive, but they will also gradually and thoroughly inoculate all of the soil for successful alfalfa seeding in the future at very small expense. At the same time they will increase the feeding value of their hay crop and furnish a very much better sod to plow under afterwards for corn.

Do not delay the cutting of alfalfa when the small shoots first appear even in rainy weather, or the alfalfa plants will be much injured and turn yellow after the crop is cut. After each crop of alfalfa hay is harvested, we advise our customers to cross harrow their fields each way with a good alfalfa spring-tooth harrow. This will tear out most of the young grass and weed plants and do the alfalfa no harm. It is very necessary to keep down the weed and grass growth in successful alfalfa growing.



## SWEET CLOVER

This is a plant which has been in past times regarded as a noxious weed by the most of farmers, but of late years the pioneers and leaders in a newer and more enlightened and progressive agriculture have been giving to sweet clover a great deal of the credit belonging to it. Sweet clover has so many good points in its favor that it seems strange that it has received so little friendly treatment from farmers in the past, but times are changing very fast and farmers are purchasing much sweet clover seed, using the crop for many purposes.

We cannot do better for our readers than quote direct from Prof. P. G. Holden in his book on Sweet Clover, published by the Agricultural Extension Department of the International Harvester Company of New Jersey to whom we return our thanks not only for the privilege of quoting this but for the use of the wonderful half-tone of the sweet clover root.

"Few people realize just how extensively it is grown in the United States. I realize that the impression of many who read this bulletin will be first, that of surprise; and second, that of condemnation, believing it will be the means of distributing a noxious weed throughout the country. I shall not be surprised if many people at first have this opinion—I have had it myself, and if I had not made a study of the plant, I should still consider sweet clover a roadside weed of little or no value. I wish to say, however, that sweet clover will ultimately be grown in many sections and upon many farms.

### A FEW POINTS WE SHOULD OBSERVE

Before attempting to grow it, we should have a thorough understanding of its requirements and habits, so that at least an estimate of its value under given conditions may be made.

I believe it will be beneficial to those who are making a study of sweet clover to note the following points:

1st. It is an excellent crop to prepare the land for alfalfa in heavy, hard and poor soils.

2nd. Its roots being softer, sweet clover becomes inoculated more readily than alfalfa.

3rd. Sweet clover does not stool as much as alfalfa. The shoots start from the main stem and on this account the mowing machine should be set as high as possible, so as to leave plenty of small shoots to start the next crop.

4th. Sweet clover will not bloat cattle or sheep. This one of its chief advantages over the other clovers. It is a great milk producer.

5th. Ground intended for alfalfa will be greatly benefited by previously seeding one and preferably two years to sweet clover, as it inoculates the soil for alfalfa.

6th. It is a valuable crop in rotation because its roots decay very rapidly, adding much humus to the soil and furnishing much plant food.

7th. It is customary to turn stock on the sweet clover in the early spring when it is young. There being no other green feed they will soon become accustomed to it and like it.

8th. Sweet clover is a great soil enriching crop. A great many of the experiments conducted to ascertain its beneficial effects prove that it is one of the greatest crops we have for the soil.

9th. Sweet clover is rich in feeding value. It contains more protein than red clover and equally as much as alfalfa.

10th. Sweet clover will grow on land too wet or on land too dry for alfalfa or red clover.

11th. Sweet clover grows more rapidly than alfalfa when young produces a good crop the first year, and provides early green pasture.

12th. It will stand more alkali or more acid in the soil than alfalfa or red clover and produce a crop.

13th. It thrives where rainfall is heaviest and where rainfall is too light to produce many other crops.

14th. It needs a firm, solid seed bed. The ground should not be loose. Many of its failures on cultivated land have been due to a loose, mellow seed bed.

A wonderful exhibition of nodules on sweet clover root. This will give the reader some idea of the wonderful ability of this plant as a n'trogen gatherer, when well-inoculated. The same nitrogen-fixing bacteria work on sweet clover roots that work on the alfalfa roots. Don't fail to inoculate your sweet clover seed before sowing with our Mulford Nitro-Germ and sow your seed on soil limed with Kelley Island Lime.



Through the great courtesy of the Agricultural Extension Department of the International Harvester Company of New Jersey we are permitted to use the above half-tone which shows up the inoculation of sweet clover so well.

- 15th. It seeds freely in humid as well as in dry sections.
- 16th. It will grow in many of the Southern States where red clover fails.
- 17th. Sweet clover makes an excellent green manure.

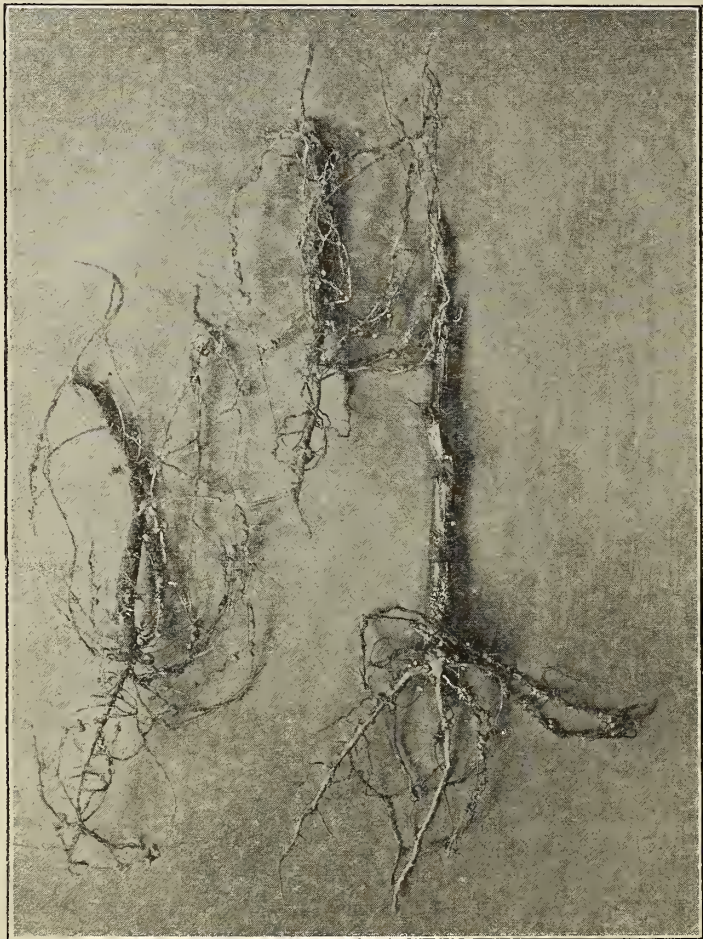


18th. Sweet clover grows best on soil containing plenty of lime.

19th. Perhaps one of the greatest advantages of sweet clover is its ability to thrive on almost any type of soil and under almost any climatic conditions.

20th. Sweet clover should not be allowed to stand too long, as it becomes woody and loses its leaves. It should be cut when 18 to 20 inches high and before it blossoms, if it is to be used for hay.

21st. It is a weed in waste places only. It never damages cultivated crops."



Roots of cowpea plants showing the nodules on their roots, one of the greatest agencies for the improvement of Southern agriculture.

## COWPEAS

About 15 years ago this legume was but little known outside of three or four Southern States. Now its fame like the soybean's has traveled all over America. Cowpeas are good feed for any kind of live stock and some varieties are very highly esteemed as food for best American citizens. There are a great many known varieties, at least 100 kinds, but some varieties are so much more superior to the average run, that we aim to handle only a few of the best.



We advise the growth of cowpeas more for southern Ohio, Indiana, Pennsylvania, etc., and on farther south. In northern latitudes soybeans are much more satisfactory and make better crops.

If it is desired to grow a catch crop for soil improvement in between other crops, the cowpea comes in there as a winner. In many places it will be a much more satisfactory crop than the soybean if the seed is broadcasted, because cowpeas cover and shade the ground more quickly than soybeans and hold back the weed growth. They will stand drouth very well when most other crops fail and are wonderful soil improvers, especially in a warm climate as they seem to require a warmer climate than the soybean. Most of all cowpea seed sold is raised in the south. It is not nearly so easily harvested for seed nor so easily threshed as the soybean. That with smaller seed yields for acre keeps the price up. But for green soiling crop, for hay and for soil improvement, they occupy now a very prominent position among the leading legume crops.

They are either planted in rows and cultivated or else sown broadcast, using just about the same amount of seed per acre as one would use of Mammoth Yellow soybeans, seeds of which are about the same size. If grown for hay we advise that equal amounts of soybean seed be mixed and grown with them. The cowpeas are more of a trailing vine nature and the soybeans help to hold them up. A tremendous crop of high protein analyzing feed can be grown by this method.

### THE UNKNOWN OR WONDERFUL COWPEA

This is the leader of all the cowpeas, perhaps, when one wishes to grow the heaviest forage yielding of any of them. This variety is not a very prolific seed bearer but as a forage variety it is certainly well named when called the Wonderful.

### THE BLACK COWPEA

The black cowpea is a very prolific seed bearer and also is a heavy forage producer. Very few varieties can excel it, either as a soil improver or for producing maximum amount of hay.

### THE WHIPPOORWILL COWPEA

This variety is one of the best known varieties of cowpeas and is an upright grower and much earlier in maturing than the Black or Unknown varieties. Recommended for easy harvesting.

Cowpeas have foliage very susceptible to the action of frosts. The same frost which might cut cowpeas clear to the ground might not injure soybeans at all. A good illustration of this can be seen on page 51, which shows Blue Ridge Ensilage corn, three rows of soybeans, each of a different variety, not injured at all by frost, growing green and thrifty next to rows of different varieties of cowpeas all of them practically killed by early and light fall frosts.

Be sure to inoculate your cowpeas using our soybean-cowpea bacteria inoculated soil, which is thoroughly inoculated with the bacteria of both legumes, as can be seen by the nodules on the roots of cowpeas and soybean illustrated in this book. This will make it unnecessary to purchase separate inoculating material for the two legumes when they are to be grown together. The growing of cowpeas has done more for the improvement of the tens of thousands of acres of so-called worn-out Southern soils than has been done through any other agency. The cowpea is called the "clover of the South."

### WINTER, SANDY OR HAIRY VETCH

This is one of the most wonderful of legumes and is destined to occupy a most important place in the future development of first class agricultural methods. A great majority of the legumes are planted in the spring, but this one is planted in the late summer or in the fall, although in a few cases it is planted and cultivated with some other crop like soybeans for instance in the spring, and then after the faster growing crop is harvested in the fall, the vetch is said to hasten up its growth and make a good stand in preparation for winter.

We are more interested in winter vetch however as a cover crop than perhaps in any other respect. One of the most neglected points in good farming is the subject of cover crops for our bare corn stubble fields over winter. It has been proven that when the temperature of the soil rises over 70 degrees Fahrenheit or perhaps less that much bacterial action is going on in our soils.

It is through the growth and multiplication of the uncounted millions of tiny bacteria in our soil, that the coarser vegetable matter and mineral combinations in our soils are dissolved and converted into forms, more easily absorbed by plants as food. Now if this action goes on when no growing plants are there, much plant food will be made available and then be leached or washed away.

How much better to sow inoculated winter vetch seed, with perhaps some rye or other cover crop seed added, in the corn field in the early fall at the last cultivation of the corn, and have the valuable crop take up a large share of the high priced nitrogen needed for its food from the air. Then the next spring, instead of having nothing but the bare corn stubble fields, robbed of lots of fertility by the washing of late fall and winter rains, to plow down, one would have a great big supply of rich nitrogenous vegetable matter to plow under for the enrichment of the land in humus and fertility.

Winter vetch does not grow straight up in the air like most farm crops but is of a reclining nature and sprawls out over the ground; the ends of the vining-like branches reach upward. We recommend growing it with rye especially when it is desired to harvest it for grain, because it is hard to harvest it for seed by itself as it would waste too much. Inventive Americans have devised various good plans of separating winter vetch seed from the rye seed.

Winter vetch hay is about the very richest of all protein hay, analyzing about 17.5% protein. We would advise a seed mixture of from three-quarters to one bushel rye per acre and from one-half to one bushel of winter vetch seed per acre. We have tried to get the highest-germinating purest seed we can buy in America. Winter vetch and spring vetch seed look very much alike and cheaper grades of seed are generally cheaper because they contain a greater or less proportion of spring vetch seed, not nearly so valuable a plant as the winter vetch.

To grow a first class crop of vetch three points are of great importance: First is seed; get the best. Second is inoculation; get the best. Third is lime; get the best.

We can furnish all three at very reasonable prices.

## CANADA FIELD PEAS

Land is becoming so much more valuable in some dairy sections of Ohio, Pennsylvania and New York, that the owners of such land feel that in most cases they can raise much more high grade milk producing feed from growing cultivated crops on it than from allowing it to remain in pasture. To follow out a system of growing green crops for forage all the whole growing season is called the soiling system. Canada field peas occupy a very leading position for that purpose, since they are the first crop in the spring to be planted.

To secure the best results with this early legume crop we advise that one bushel or more of Canada field peas be first sown broadcast per acre on well prepared ground, drilling them in three inches deep if possible. Then if one dares to risk waiting several days, wait that long and sow one or more bushels of large growing oats per acre, drilling in the oats shallow. The plan in mind is to give the field peas a chance for a good start.

The oats and peas sown together give a much larger crop of green feed or hay than either sown separately. Canada field peas are legumes and to secure the best results from them, both for crop and for soil enrichment, we advise our customers to order liquid culture inoculation material from us if they are unable to secure inoculated soil. Many dairy farmers make a practice of making ensilage of what is left of the field of Canada peas and oats after feeding them green up to nearly time for maturity. They, like most legumes, are wonderful milk producing foods, due we suppose to large protein content. Progressive dairymen should grow much more of them in the future.

Canada field pea hay analyzes 13.7% protein and the silage is very rich.

analyzing 5.9% protein.

It was proved at Cornell Experiment Station that if oats were grown with field peas which were inoculated the oats would be far richer in protein. **So for the good of the oats as well as for that of the field peas do not neglect to inoculate them.** We can furnish you the very best of liquid culture inoculation.

## MEDIUM RED CLOVER (*TRIFOLIUM PRATENSE*)

Red clover is the greatest of all hay crops which we can grow generally speaking in the Northern States, although it will not thrive on water soaked or acid soils. When cut soon after blooming a second good crop can be cut the same year either for hay or seed. One of the best crops we have ever seen grown of the best of legumes for all conditions was grown by one of our next door neighbors several years ago. From an eight acre field, he harvested thirty-two loads of first crop clover hay and from the big second crop, which looked, before heads ripened, like eight acres of solid red clover blossoms, he threshed twenty-four bushels and ten pounds of cleaned seed which he sold right on his own premises at \$10.00 per bushel.

He secured this crop right after liming this field for the previous wheat crop. An adjoining field, not limed, had in the previous season, yielded only nine loads of inferior hay from eight acres.

We feel sure that few things could please Dr. Thorne of Ohio Experiment Station any more than to know that the great majority of farmers of Ohio were making a first class success of raising clover on their farms, right along every year. One ton of Kelley Island agricultural lime or two tons of Kelley Island fine ground limestone per acre will in the great majority of cases, cause clover to grow rank as weeds.

The seed may be sown by several methods and under different conditions. We think by far the best results may be secured by seeding it with a thin stand of early maturing oats like our well known Sixty-day oats. The oats crop is harvested before it harms the young clover too much by robbing it of its moisture supply. The old method of sowing clover seed was to sow in on a quiet morning in February or March, just while the ground was honey-combed with frost. Many experts now advocate sowing clover seed with a special grass seed disk drill after the ground is fairly well settled, so that driving over the wheat field with machine will not cut up the field.

## MAMMOTH RED OR SAPLING CLOVER

This variety of clover is somewhat similar to medium red clover and seed looks almost like the seed of medium red clover. It is later maturing than is the medium red clover. It is often sown with other later maturing grasses like timothy. The quality of mammoth clover is not so good as that of medium clover, but it has a great many friends. The first crop of mammoth clover hay is apt to be very noticeably larger than first crop of medium clover.

Sow the same amount of seed per acre as one sows of medium clover. Seeds of most all the clovers weigh sixty pounds per bushel.

## ALSIKE CLOVER (*TRIFOLIUM HYBRIDUM*)

This valuable variety of clover has a very small dark green seed and requires only about half as much seed per acre as the red clovers require to secure good stand. It is more hardy than the other varieties of clover and will do well on soils too wet or too acid for production of red clover. It does not grow so tall as does red clover, but makes a very solid crop of forage of fine quality. A very large proportion of farmers are now making a mixture of timothy, medium clover and alsike clover. This makes a very heavy crop of high quality. Many progressive farmers are sowing with this mixture enough alfalfa seed to give about one quart of alfalfa seed per acre.

If the alfalfa thrives it will improve the quality of hay considerably, will help to inoculate the soil for alfalfa in case one should ever intend in the fu-



ture to grow it there and will also add to the good chances of following corn crop. We have found out, however, since liming our fields that the alsike clover grows so very thrifty that it crowds too much of the red clover out. A quart of alsike clover seed per acre mixed with the other grass seed will add a considerable amount of hay per acre in the new crop. Alsike clover will often live over and help to make additions to hay crop, on the following years, while the medium red clover does not benefit us but little the second year.

### CLOVER SEED

We buy and sell only one grade of clover seed and that is the purest and the highest germinating seed we can buy. **The best is none too good for us; neither is it too good for the other fellow.** We undoubtedly could sell several times as much seed as we have done if we would handle some cheaper grades of seed, which could be sold for \$1.00 or \$2.00 per bushel less, but we believe it would be poor business policy for us to do so. **For the great majority of customers will remember the quality long after they have for gotten the price.** That would apply to poor quality of clover seed ever more than to good. We consider clover seed containing bad weed seed about the greatest curse which can be brought onto a farm. If you order clover seed from us you may rest assured that we will ship you the very best we can find in Ohio.

### TIMOTHY (PHLEUM PRATENSE)

Timothy is perhaps the most commonly grown of any of the different farm grasses in the northeastern part of the United States. It is such a hardy perennial grass and has so many advantages which appeal to most farmers that much more timothy is grown in many states than all the other grasses combined. It is not so well adapted for sod-forming for permanent pastures but for meadows it is remarkably satisfactory, both because it is easily and cheaply grown and harvested and if well fed will give tremendous crops of hay, which bring high market prices. In July, 1910, a timothy seedling at Ohio Agricultural Experiment Station gave a yield of 4.85 tons per acre of thoroughly cured hay.

Timothy is not a legume which means it is a soil robber. The fact that it is hardy, yields very heavy and sells for good prices on the market, have all combined to make timothy the instrument for the greatest of all the soil robbery which has taken place on Northern farms, just as cotton and tobacco have ruined so many farms in the South.

Timothy hay has a very low protein value, only 6%, but it was proved at Cornell Experiment Station that timothy grown with red clover **especially if limed** would contain very nearly 9% protein, so grow your timothy with clover, in order to help make the timothy much better for hay. It pays very well to lime ground for timothy just as it does for corn and clover.

The very best timothy seed one can buy is not very expensive because a few quarts of seed per acre is a plentiful seeding. Cheap timothy is very apt to contain very bad weed seeds, and there is no economy at all to use it no matter how cheaply the seed may be purchased. We sold timothy seed last year which suited both us and our customers very well. It was tested at Wooster Experiment Station and found to contain **no weed seed at all and to be 99 9-10% pure.** We hope to have nearly perfect seed to sell again this year coming.

### DWARF ESSEX RAPE

This is one of the most valuable of all crops intended for soiling or for pasture and yet in spite of its great value in that respect it is, comparatively speaking, used by but few farmers. Rape is not a legume, but its good points help to make up for that lack. It has been esteemed very highly in England for perhaps a hundred years or more as a pasture crop for sheep. It belongs to the cabbage family and sheep, especially, are very fond of rape. A whole field is planted to Dwarf Essex Rape. One side is fenced off by means of hurdle fences and sheep are turned on the rape which is eaten down one section of the

field at a time. By the time all the field has been gone over the first sections used will be growing up rank again. A field of rape is an inspiring sight to a stockman who knows its great value as a sheep and hog pasture. Everyone interested in the successful and economical production of pork should secure a copy of Bulletin No. 242, Forage Crops for Swine, issued by Ohio Agricultural Experiment Station at Wooster and study the remarkable gains made by swine on rape pasture, compared with more ordinary feeding.

There is a chance now to make a lot of honest money, growing hogs on our eastern farms, more so perhaps than with any other class of fat stock. Hogs do best on large leafy succulent crops containing but a small proportion of indigestible stalks and stems, eating of course a fair amount of corn at the same time.



Good specimen of Dwarf Essex Rape plant, nearly 3 feet wide, which grew in same row with Stone's Roosevelt Soybeans.

**Dwarf Essex Rape** is very easily grown. Ground should be prepared for it early in the spring and the seed sown in rows about 28 or 30 inches apart. The seed is very fine and can be sown through the grass seed box of a combination grain and grass seed drill; by turning the tube spouts down into hoes of grain drill. Or perhaps a better way would be to mix 3 to 4 pounds of Dwarf Essex Rape very thoroughly in the fertilizer which you intend to use on each acre of your rape field, so when you sow fertilizer with grain drill you will sow rape seed at the same time, through every fourth hoe of drill. Then cultivate the crop once in a row a few times with a one-horse cultivator. Under favorable conditions you will have a very fine crop, three or four feet high, a crop which will make your hogs fairly grunt with pleasure. One of the best things in connection with this profitable way of growing hogs is the fact that all of the very valuable excrement from them is deposited fairly evenly over



the whole field which they are harvesting for you without labor. Perhaps it may sound the other way to some farmers, but we think that an intelligent business farmer should use every honest way he can to lighten his work and increase his net income. At present prices it takes about six fair-sized hogs only to bring in about \$100 in cash. **Why not go after a few of those \$100 bank notes in 1915, by growing a good rape field and turning a bunch of good shoats on it after it is well started.**

We handle one grade only of Dwarf Essex Rape Seed and that is the very best, highest-germinating, purest seed we can buy in America. We advise you to order your supply now and order plenty of seed, because if you have sheep or lambs on the farm, we want you to sow Dwarf Essex Rape in your corn field next fall, along with some winter rye, and winter vetch seed before the last cultivation of corn. Then after your cornfield is cut and corn is husked, what a happy, delightful, prosperous time your sheep and lambs will have trying to eat up all the rape. With good luck you will have from one to three feet of growth all over the field, and that growth will hold there until finally hard winter weather in January will cause it to die down. We call this good farming. Your sheep will agree with us if you try them on Dwarf Essex Rape. If seed is sown broadcast, use twice as much seed per acre as when sowing in 28 inch rows to be cultivated.

In June, 1914, we sowed some Dwarf Essex Rape seed mixed with soybean seed in 28-inch rows. The rape attained a very large size by fall and did not seem to injure the soybean growth at all, but we believe the inoculated soybeans helped very much the growth of the rape. This combination of soybeans and rape furnishes a very good plan for hog pasture since the rape will continue to grow and thrive until winter, long after the soybeans are gone.

## OATS

It is surprising what a large proportion of farmers are raising all kinds of old mixtures of lots, instead of growing some one of the very high-producing newer varieties. The new and improved varieties which we are offering for sale to our customers are the best varieties of which we have definite knowledge. All of the seed oats we are offering for sale are grown by the very best class of intelligent progressive farmers right in close proximity to us here, except of course what we grow ourselves on the home farm.

We clean these oats over a good fanning and grading mill in order to screen and blow out the weed seed, light oats, chaff, straw, sticks, etc., found in oats after being threshed.

Oats do their best in a cool climate. Judged by the average conditions of climate in Ohio as determined by reports of the weather reporters from all parts of Ohio for many years, we have the coolest climate here of any part of the State. The climate here therefore is very well suited to the growing of oats.

## SIXTY DAY OATS

This variety of oats is now in great demand all over the rich farming section of the eastern states. It has two or three very good points in its favor which put it in a class away in advance of almost all other varieties.

It is the earliest of all good varieties of oats. It is one of the very heaviest yielding of all varieties of oats, tested by Ohio Agricultural Experiment Stations and they have tried out perhaps 200 varieties of oats. It has about the shortest straw of any of the good varieties. This is very important to the farmer who possesses a good rich soil, because on such a soil, large growing varieties of oats are almost sure to cause trouble in harvesting it if summer storms are at all common. How much hard work and worse language has been caused in the past by the sowing of large-strawed varieties of oats we may never find out, but Sixty-day Oats are a great boon to the very best farmers all through the corn belt. They can get the big yield of oats without having a mess of five or six foot tangled down straw to handle. Sixty-day oats are in greatest demand however as a nurse crop for either alfalfa or clover. They are a very small-berried oats and stool out well on good soil so that,



when used as a nurse crop with grass, one and one-quarter bushel of seed per acre is a great plenty. They are yellow in color and are a branching variety.

### SIBERIAN OATS

Siberian Oats have an eight years' average of 70.95 bus. per acre at Wooster Exp. Sta., per year, which puts them up at the top notch. These oats are tremendous yielders, our seed coming from stock raised in a crop, standing as high as a man's head and yielding 86 bushels per acre, thrasher's measure. We have thoroughly re-cleaned our oats and they look very attractive. Our stock is bound to go quickly, so order early. Siberian oats are white and yellow in color, have fairly stiff straw of good height, and ripen at about the average date that most other varieties ripen. Seed is large sized and we advise  $2\frac{1}{2}$  or more bushels per acre for full seeding.

### SWEDISH SELECT OATS

Probably no variety of grain has ever had such extensive advertising as has this variety of oats. They are certainly a grand variety of white oats of branching type. They don't grow on the average quite so tall as the Big Four. We know that down in Wayne county at Wooster Experiment Station, Swedish Select oats do not yield nearly so well as other varieties. Yet up here in Portage county, we know of their yielding between 80 and 85 bushels per acre on soil, not nearly so fertile as that at Wooster Station. If our customers should judge our oats by the size and weight and looks of the seed grain we would be apt to sell all of our Swedish Select Oats before we sell any other kind, because they are certainly the nicest looking seed oats we have ever had. Send in your orders early for seed oats, especially of this variety because there is sure to be a large demand for them, especially for the Swedish Select and Sixty-Day varieties. We advise the sowing of from two and one-half to three bushels of Swedish Select oats per acre, on account of size of the seed.

### EARLY ORANGE SORGHUM

This is a variety of sorghum, especially valuable as a forage plant for fall soiling purposes for cattle. Very few men who grow sorghum for this purpose but what are very enthusiastic over its use. It is drouth resistant, grows very fast, and is a tremendous forage yielder. On account of its being so sweet, it is very much relished by swine as well as by cattle. Ground should be carefully prepared for sorghum planting because seed is small and needs a good seed bed for a start. Use about 20 pounds seed per acre if planted in rows far enough apart to be cultivated and plant from one to two inches deep. If sown broadcast use about 75 pounds seed per acre. The first crop may be cut for feed almost any time up until it is nearly ripe. If it is cut early it will sprout up and make second crop, but exercise care and judgment in feeding the second crop. If desired more for syrup we advise our customers to order us to get the Early Amber Sorghum for them. A yield of thirty tons of green sorghum feed per acre is nothing very unusual on good rich warm soils.

### PEDIGREED SEED WHEAT

No farmer can really afford to grow any variety of wheat other than the best, considering the price of labor and the investments of other kinds for the crop. Wheat growing in the U. S. gives promise of being fairly profitable for several years to come on account of the demand for it from the European war zone. If ever there was a time to grow the very heaviest yielding varieties of wheat, to fertilize them heavy and give them good care it is in the immediate future.

Several years ago we secured from Prof. C. G. Williams, Chief of Agronomy of Ohio Agr. Experiment Station, small quantities of five strains of his wonderful pedigreed varieties of wheat for trial. Our seed wheat has been propagated from this very small start. These strains of wheat have all been yielding much more grain and straw than the original varieties from which they were selected. The increased yields of grain we believe come mostly from the increased size of the heads compared with ordinary wheat.

This can be seen very well in the illustration of heads of our pedigreed Poole wheat, shown in this book. We advise our customers to write to Ohio Agricultural Experiment Station at Wooster, O., and ask them for Bulletin No. 231, on Wheat Growing. It is a very valuable bulletin and every farmer who grows wheat should read it.

In growing the largest crops of wheat possible, farmers must use plenty of agricultural lime. It will pay well on wheat as well as other crops. On some plots at Wooster Experiment Station, lime gave a yield of  $5\frac{1}{2}$  bus. more wheat per acre. Think of it! Enough to much more than pay the whole expense in liming the soil. Tests there at Wooster have proved that the best amount of seed wheat to sow per acre is 8 pecks and that seedings made Sept. 22nd. have given the largest average yield for a number of years.

We expect to have a quantity of the pedigreed strains of wheat to sell in the fall of 1915. Write to us for prices then and order seed early.



Some heads of Pedigreed Poole Wheat, which has averaged over 45 bus. per acre at Wooster, O., Experiment Station.

#### PEDIGREED POOLE WHEAT

Our pedigreed Poole wheat is a mixture of Poole No. 6400 and Poole No. 6545, which have a 3-year average yield at Wooster of nearly 45 bushels per acre and an average straw yield of 4230 lbs. per acre. It is a smooth wheat, grows fairly tall and has large heads. The milling quality of this wheat is very high and it is yielding at Wooster Station about  $5\frac{1}{2}$  bus. per acre, more than the regular strain of Poole wheat.

Last fall we threshed a field of our Pedigreed Poole Wheat which yielded 43½ bushels per acre, by far the largest yield we have ever had, for our farm is not well adapted to wheat production. This field was planted about Oct. 1st, 1913. It had grown a crop of soybean hay. This stubble was disked and the wheat was sown with a disc drill and fertilized with acid phosphate. This field had been well limed for corn with the Kelley Island Ground Limestone. It was a very profitable crop.

#### PEDIGREED GYPSY WHEAT NO. 6100

This variety of wheat is a bearded one. It is a very hardy variety of winter wheat and we believe is the hardiest of all of the pedigreed strains of wheat which we sell. It is a red wheat, grows about 48 inches tall and is very resistant to lodging.

Its average yield at Wooster, O., Station in grain is 42½ bushels and in straw is 4751 lbs. per acre. To say that it is a very good variety is putting it very mildly. It is yielding 4 bushels more per acre than ordinary Gypsy wheat.

#### PEDIGREED FULTZ WHEAT

Our Pedigreed Fultz Wheat is a mixture of No. 5309 and No. 5310. It has a 3-year average yield at Wooster of over 44 bushels per acre or 4½ bushels more per acre than the regular strain of this variety. It is a red-berried, smooth-headed wheat with a white chaff. Heads are very large. Fultz wheat has always been such a favorite that this variety is apt to be the first one to be sold out this coming season.

#### WINTER RYE

We wish our customers for seed rye for cover crop, soiling and grain growing purposes would engage their seed from us early in the summer, so that we may have a chance to secure enough good winter rye to supply the demand. Winter Rye is not as valuable as a legume, but is practically a sure crop.

The very best farmers all through this part of Ohio are now making a practice of sowing rye in their cornfields in the late summer or any time after corn cutting up to nearly December. Rye is very hardy and will make quite a crop of green forage to be plowed down for soybeans, potatoes or some other crop to be cultivated that season. One of the greatest losses to farmers in the corn belt is the loss from the leaching of soils containing no growing crop during the late fall, winter and early spring, because the bacteria in the soil keep on making plant food available during all the time the soil is not cold. Winter vetch, well inoculated, should be sown with the rye, so as to not only hold the fertility of the soil but to add to it.

#### STONE'S NON-BLIGHT POTATO

For quite a good many years potato growers have suffered a great deal of loss from the potato blight disease. About the only good remedy for this disease that has ever been proposed and used in the past has been the spraying of the growing potato tops with Bordeaux mixture from the time they are six to ten inches high every week or ten days up until the growth of the tops will prevent further applications. This is the only preventative which we advise for potato blight when the growers are planting the generally used varieties, practically all of which are very susceptible to the action of blight.

But we are offering for sale this year to our customers a potato for which blight has practically no terrors. Stone's Non-Blight Potato will give you about the rankest strongest growth of potato tops which you have ever seen. They are full of vigor, if ever any potato was and keep right on growing green and thrifty through the most unfavorable seasons, just as if they never intended to die at all.

We advise that they be planted earlier than other general crop potatoes in order to utilize as much of the growing season as possible before frost kills them down. Strange to say, although this potato grows like a rank weed and



yields enormous crops of tubers, yet the cooking quality of Stone's Non-Blight Potato is fine. They cook very well even if they are dug when immature and the flavor is, we think, much above the quality of the great majority of late general crop varieties of potatoes.

How large a yield might be secured from this variety under perfect conditions for potato culture we have no means of knowing, because conditions of soil and climate existing in this section are not favorable to the largest crop yields of potatoes. But we do know of men growing 300 bushels of the Non-Blight potatoes per acre under no very strongly favorable conditions. This variety of potatoes set more tubers per plant than any we have ever seen. Now if they only have a fair chance to reach their natural size, the grower is sure to get a tremendous yield. Seed of this variety is not apt to last very long after seed-selling season is well started so order your seed early in order to get a supply.

We are generally in position to supply seed of other standard varieties of potatoes early in the season, as we are situated very close to a large potato-growing section. So kindly write to us of your wants in the line of seed potatoes and give us a chance to quote prices to you.

## SILO

We know of no one thing which has stirred up such an enthusiasm in the feeding of live stock, especially of dairy cattle as the silo has done. If any man ever spent even one year at dairying he would know without any more experience that it is practically impossible to keep up as good a flow of milk in winter time on dry feed as in summer time on grass. Now the silo has made a remarkable change in that respect. No farmer who has a silo, plenty of good protein hay and some concentrated food to balance up the ensilage properly, needs to be afraid of his cows going dry on account of having no grass to eat. In fact many men are now filling smaller sized silos for summer use at the same time that they fill the larger ones for winter use, so that they are in shape to feed silage the year round to their cows. The summer silos are made smaller in diameter than those for winter use so that the ensilage made be fed off fast enough as not to spoil.

If one gets into a crowd of dairymen, anywhere, either at a wedding or a funeral, he finds the interest in ensilage can't be held down, and that some one is almost sure to mention the word silo inside of a few minutes. It attracts more interest than alfalfa discussion, because every farmer can grow some kind of ensilage corn, but many can't grown alfalfa at all, not to speak of getting a satisfactory crop.

We have many requests for information about silos and ensilage, which we try to answer as well as time and our knowledge will permit. Most all of the silos which are now widely advertised are good silos, but some makes of silos are unnecessarily costly and don't make any better ensilage than well built silos of other construction costing less than one-half the money. The principal points to keep in mind in silo construction are, First: Put in a good solid concrete foundation; well underdrained so that frost won't crack it. Second: Be sure that walls are air-tight, because air will spoil the silage. Third: Every kind of silo should be well braced with either strong iron rods, wires or wooden hoops to hold solid and tight even under very severe lateral strain. Fourth: For ordinary size dairies don't build silos over 10 or 12 feet in diameter or you can't feed it off fast enough to keep ensilage from spoiling. A silo 14 feet in diameter will hold a tremendous lot of feed in only one or two inches of depth. Rather than build the silo larger than this in diameter, we would advise to build it higher or else build two of them.

Concrete silos on good solid foundations and well reinforced throughout make good ones. Tile block silos are very good ones if no mistakes are made in construction. They should however, have iron bands or hoops around them at reasonably close distances to prevent cracking of the wall, which often happens if walls are not braced in that way. Those who own stave silos held together by outside hoops only should keep a watchful eye on the hoops during summer and early fall when they are empty, or they are apt to be blown down during heavy wind storms when the hoops and staves are loose. Lath and plaster silos and the famous elm hoop silos are the most cheaply constructed

silos of any because there are no patent rights; nor agents' commission, nor fancy material for which to pay and it does not require a high-priced architect to draw up plans for their construction.

## ENSILAGE CORN

We make a specialty of supplying seed corn for growing ensilage specially suited to the different needs of our customers. In the following list of varieties of seed which we sell, you are practically sure to find a variety suited for your needs.

Last year we sold a tremendous lot of ensilage corn and this year indications point to much larger sales, because our seed corn which we sold last year gave such good satisfaction. The largest varieties of ensilage corn we sell come from the south and are giving remarkable heavy yields of ensilage per acre on Ohio soils, but for New York, Michigan and other states farther to the north we would not recommend any of these with the possible exception of the famous Blue Ridge Ensilage corn. Our northern Ohio varieties like Leaming Pride of the North, etc., would be better suited to conditions in these more northern states. Order your seed corn now even if you don't want it shipped until April or May.

We want to be prepared for the rush of spring shipping when it comes and have on hand a plentiful supply of good ensilage seed corn with which to fill our orders. If you send your orders now we will have the best chance to engage enough of the best grade of seed. We try to make quality of seeds and service to customers of first consideration, but if you want to save a little on the price ask your neighbors to club together with you, and ask us for prices on large quantities. **But send us your order early.** You will help yourself, as well as us, very much by so doing.

Experiments at the Wooster, O., Experiment Station have shown very conclusively that it pays to plant ensilage corn very much more thickly than field corn. In a favorable corn year ensilage corn planted 4 inches apart will give nearly 50% more tonnage per acre than if planted 6 inches or farther apart and taking the five years average of trials for 4-inch, 6-inch, 10-inch and 12-inch plantings, the 4-inch plantings have given an average yield of 30% more nutrients per acre than any other planting. This is conclusive enough to satisfy us.

Do not plant your ensilage corn as deep as you would ordinary northern-Ohio acclimated seed corn, especially if the soil is cold or wet. Its vitality is not quite so strong under adverse conditions. We believe that a large proportion of farmers do not appreciate at all the value of clover sod plowed down for corn. Alfalfa sod if of course even better. If from 8 to 12 loads of good stall manure, each load covered with about 40 or 50 pounds of acid phosphate, is applied with a manure spreader to each acre of clover sod at some time during the previous fall or winter, then the farmer will have about the best possible chance to raise a bumper crop of corn, providing he has good seed of a good variety and gives the crop proper care. Judging by what we have seen in years past, we doubt if many farmers have ever tried their very best to grow a big crop. Acid phosphate is now very cheap in price, but it is just as valuable as ever in increasing the yields of all kinds of crops and helping them to mature at an earlier date. For every dollar spent on acid phosphate for corn, about eight dollars will be returned to the investor in increased value of the following four or five crops.

## JOHNSON COUNTY WHITE CORN

This is the most famous variety of show corn in the world. It is a large white corn which has received a great deal of careful breeding for exhibition purposes, in the class of largest and most perfect ears. L. B. Clore of Indiana has attained a world-wide reputation as a corn breeder on account of his wonderful achievements in perfecting this variety of corn for show purposes. A few years ago, he won \$1,000.00 in prizes on a small exhibit of this variety at the National Corn show. It is hardly necessary to say that his chosen ears of corn were the finest looking ears of seed corn in the United States.



Johnson County White Corn is suitable for grain growing in southern Ohio, where it could not be excelled if even equalled in that respect by other leading varieties. We are recommending it to our customers in northern Ohio as a wonderfully good variety to grow for ensilage in cases where the ensilage is wanted for fattening cattle. This variety will give a tremendous crop of ears and very large fodder as well. While it will not give as large a tonnage of ensilage per acre as will our regular ensilage varieties, yet it would be far superior to practically all of our native northern Ohio varieties in the production of ensilage as judged by both tonnage of grain and tonnage of stalks per acre. One of our customers reported nearly twice as much ensilage per acre from our Johnson County White Corn as from his native variety.



Typical ears of Johnson County White Seed Corn. These are not show ears but ears picked from regular seed corn supply.

Many farmers who will not plant southern ensilage corn will try to fill their silos with their ordinary-sized native varieties of corn. We have known some men to put about 20 acres of their field corn in one silo, 12 feet in diameter and 30 or 35 feet high. Then they would have to buy ear corn to feed that winter to other stock, because they had put all of their own corn in the silo in order to get enough bulky feed for their cattle. Why not grow about one-half or two-thirds as much Johnson County White Corn for filling the silo and plant other corn for husking.

Our seed is grown for us by a very able farmer who secured his seed direct from L. B. Clore, the great professional breeder of Johnson County White Corn. Last spring we sold enough seed of this variety to one of the very finest stock farms in America to do for seed for about 75 or 100 acres of ensilage.

### BLUE RIDGE ENSILAGE CORN

This variety of ensilage corn is grown up in the Blue Ridge Mts. of Virginia by an old seed corn grower who has specialized on this variety of corn for years. It is claimed by the grower of this seed corn that on account of its being grown every year at a much higher altitude than that in which the other Virginia corn is grown and matured for seed, that it naturally ripens much earlier and is much better suited as an ensilage corn for stockmen in Ohio and other states.

Our Blue Ridge Ensilage Corn is all graded corn, large beautiful white kernels, and will germinate very close to 100% every year. In shape the kernels of Blue Ridge corn are about the shape of Stone's Eureka Ensilage Corn, but very much larger. In our tests last year we found that Blue Ridge Ensilage Corn would tassel out about a week or ten days before the Eureka. It is becoming a very great favorite in this section of Ohio because of its



earlier maturity as ensilage corn and the quantity and quality of the ensilage made from it.

In a 5-year trial at Wooster, O. Experiment Station of eight varieties of large growing corn for ensilage, Blue Ridge Ensilage Corn gave on the average, more tons of ensilage per acre, more tons of protein per acre, more tons of crude fiber per acre, more tons of nitrogen-free extract per acre, and more tons of fat per acre than any other of the eight varieties. It produced 15% more nutrients per acre, on the average than Hickory King, a large Virginia field corn sometimes used for ensilage and 26% more nutrients per acre than Leaming corn of an old well-known Ohio strain. Blue Ridge Corn generally yields about one-half again more ensilage than Ohio Leaming Corn.



Blue Ridge Ensilage Corn at the right, different varieties of soybeans in the center, and varieties of cowpeas at the left. Note that the cowpeas have been severely injured by early frosts while soybeans and corn are not but little if any injured by same frosts.

Blue Ridge Ensilage Corn does not grow so tall as does Stone's Eureka Ensilage or "Old Virginia" White Cob Ensilage and will not make nearly so many tons of ensilage per acre as the Eureka. But "Blue Ridge" is far superior to any of the native varieties of corn in northern Ohio in the production of ensilage. So popular has it become in this section of Ohio that over 4000 bushels of this seed are now used here for ensilage planting.

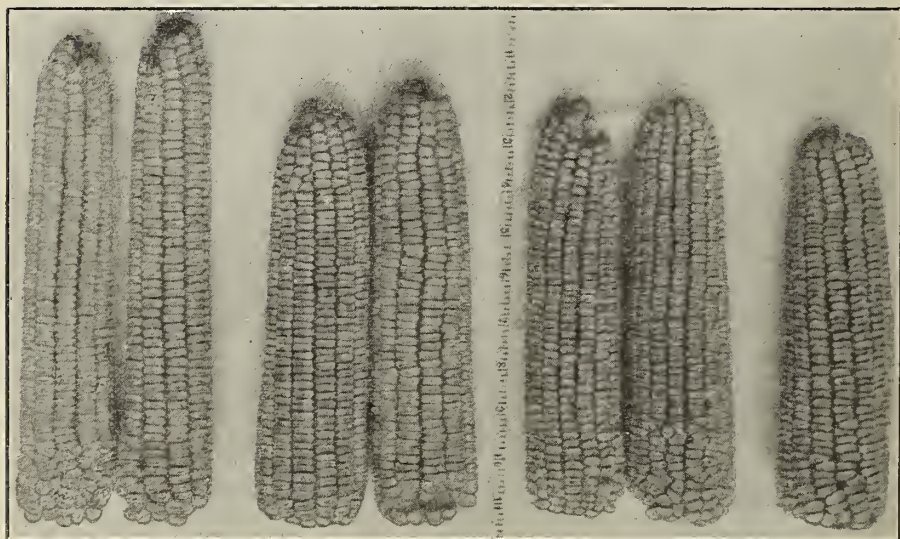
All of our 1914 customers for "Blue Ridge" seem to be pleased with the resultant crops. On account of the kernels of this variety being so very large we advise planting at least 12 quarts of seed per acre, if not one-half bushel.

**STONE'S EUREKA ENSILAGE CORN**

This variety of giant Southern ensilage corn is perhaps the greatest favorite of all varieties of ensilage corn, take it the country over, for it seems to be as popular in the dairy districts of the East as it is in Ohio. To give our customers an idea of how popular it is, we will say that one county alone in Virginia is reported to have sold over 60,000 bushels of Eureka Ensilage Seed Corn in a single season.

Our "Eureka" has much smaller kernels of corn than the "Old Virginia" or other varieties of ensilage corn, so that it does not take nearly so much seed per acre to get a thick stand as it does of the other varieties. Stone's Eureka Ensilage Corn is just as likely to produce two ears per stalk as the Old Virginia is apt to produce one. We do not know how tall it would grow if it had a good chance, but we measured stalks in one field of "Eureka" last fall, which had been held back all

**Four excellent varieties of large ensilage corn.**



**Stone's Eureka. "Blue Ridge." "Old Virginia." Virginia Red Cob.**

summer by steady drouth and yet they measured about 14 feet high and had as many as 21 great wide blades to the stalk. We have never heard of its being tried at Wooster in comparison with "Blue Ridge" Ensilage Corn, but do not doubt that it would outyield it a good many tons per acre. It is an awful big corn. See the illustration on front page of catalogue of Stone's Eureka Ensilage Corn just after it has tasseled out. This corn was planted about June 25th in ground which had grown soybeans for several years previously. The growth of the "Eureka" came very largely from the nitrogen left in the soil by the nodules or tubercles of the soybean roots of the preceding soybean crops, because no manure, lime, nor fertilizer was applied for this crop.

**"OLD VIRGINIA" WHITE COB ENSILAGE CORN**

This is one of the most popular varieties of ensilage corn in this part of Ohio. The seed is grown in Virginia and we aim to buy the best grade we can get. This corn is a tremendous cropper. We have seen fields of it, 14 to 18 feet high. Five to eight acres of it will ordinarily fill a good sized silo clear to the top with some left over. The kernels of seed are very large and the stalks if far apart will be about the size of a man's wrist in circumference. We advise our customers therefore to use from ten to twelve quarts per acre of the "Old Virginia" Ensilage Seed Corn. Thousands of bushels of seed corn of this variety are now used in eastern

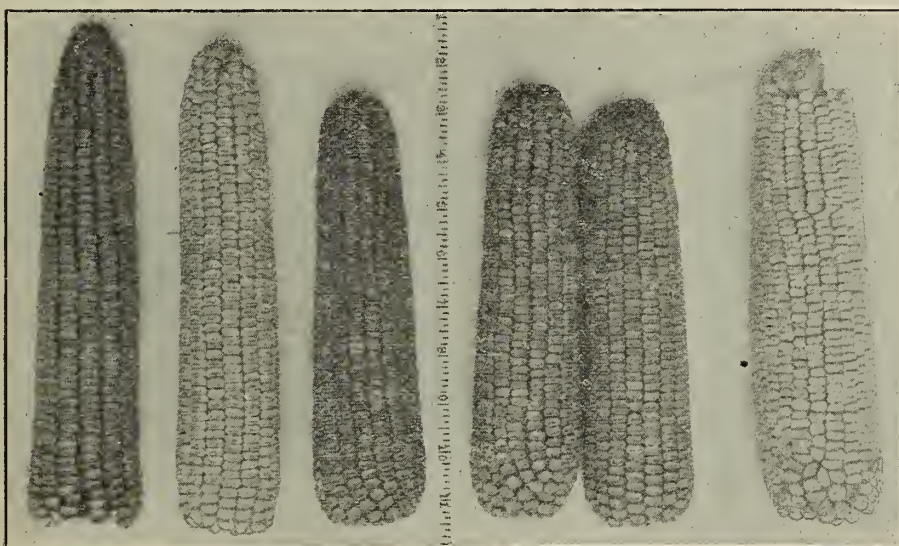


Ohio for ensilage seed. When thousands of the most progressive dairymen will use this seed corn for ensilage one year after another, rest assured that it must have remarkably satisfactory qualities.

### "VIRGINIA RED-COB" ENSILAGE CORN

This is a variety of southern ensilage corn which resembles "Old Virginia" very much in the looks of the kernels; but this variety of corn has large long white kernels on a red cob while the "Old Virginia" Ensilage has large white kernels on a white cob. This variety of corn is earlier in maturing than is the "Old Virginia" and consequently does not grow quite so tall nor make such a big tonnage. Some of our customers have such rich land that their complaint about "Old Virginia" is that it makes too large a growth. So they grow Red Cob Ensilage corn, so they can see the tops of the corn tassels without backing over onto the neighbors' fields. We sell quite a lot of Red Cob Ensilage corn, because it is an old favorite and a good consistent cropper.

Typical ears of five noted varieties of Ohio corn.



Leaming. North White. Clarage. Reid's Yellow Dent. Boone County.

### BOONE COUNTY WHITE CORN

This is one of the finest varieties of large white corn grown in central or southern Ohio either for show purposes or for market. It is also a great favorite in any other state where the climate is suitable for growing a large late maturing corn. Ears of Boone County White Corn contain from 18 to 24 rows of very deep, white kernels with large germs on medium sized white cobs. It is one of the very best types of white dent corn for the Central Corn Belt and is one of the prize-winning white dent varieties of corn. The ears are on the cylindrical order and are usually ten or more inches long. Kernels are a little on the rough order, which is commonly the case with deepkerneled varieties of corn.

### REID'S YELLOW DENT CORN

This variety of corn was originated in 1846 by Robert Reid, a Buckeye farmer, who had moved to Red Oak, Ill. It was a cross between an Ohio and an Illinois variety. This is the most popular yellow dent variety of Ohio corn at all the shows. If any man wishes to grow a variety of corn from which to pick fancy show ears then let him grow the Reid's Yellow Dent. A fine selection of Reid's Yellow Dent



ears is a very beautiful sight. Ears of Reid's Yellow Dent are cylindrical in shape tapering gradually to the tip. Ears are  $9\frac{1}{2}$  to  $10\frac{1}{2}$  inches long with circumference of  $7\frac{3}{4}$  to  $7\frac{1}{2}$  inches. Cobs are red and cobs and shank are both small. We do not recommend this variety for northeastern Ohio for grain production because it is too late a variety. It is a very good variety for very good corn land when the growing season is long enough.

### IMPROVED LEAMING CORN

Leaming corn was originated by J. S. Leaming in Clinton county, Ohio, in 1856. By continuous selection he fixed the type of this variety and his sons are growing it now. Our seed is an improved strain grown up close to Lake Erie in the central part of Ohio. The ideal stalk is of medium height with a large number of broad leaves. Ears should be not too high from ground and stalks produce two ears under favorable conditions. With good care and soil it is possible to grow 100 bushels per acre of this variety of corn. It is a very great favorite as a field variety all over Ohio, especially in the western part. We know that our seed which we secured from Northern Ohio last year ripened well for customers located within a few miles of us in spite of a very short growing season. This variety is a favorite variety for ensilage in New York state and we ship a big lot of seed into that state for ensilage growing. This variety would also be well suited for Michigan dairymen's needs also. The ears of this variety run from 8 to 11 inches long and 7 to 8 inches in circumference. Ears have 16 to 24 rows of rich golden yellow dented kernels.

### CLARAGE CORN

This a beautiful yellow dent corn originated by a Mr. Clarridge of Fayette county, Ohio. He selected his corn originally to get early maturing ears, with straight rows of very deep kernels. He also wanted his corn to be very deep yellow in color, with honey yellow cap. He selected his seed corn in the field while the corn was maturing and developed a very good type of corn.

This variety of corn is a great favorite with shippers of market corn, because a carload of it is not only of good quality, but it looks very good. Clarage corn is the great standard variety of corn grown at Wooster, Ohio, Experiment Station in all of their tests. Trials of it made up in this section have not been very satisfactory because it is too late a variety for us. This would be a good variety for ensilage in latitudes farther north than us, where they did not care to have corn ripen up solidly but wanted a big crop of fodder and corn.

We are sometimes in position to sell a limited quantity of pedigreed Clarage corn to those who would like the very best seed in that line. If interested in this, write to us early in the season about it.

### NORTH WHITE DENT CORN

This variety of corn, bred and grown up close to Lake Erie is one of the very best varieties of early white corn in Ohio. It has nice long slender ears of pure white corn, containing from ten to sixteen rows of kernels, rows well filled. The grower claims this variety to be very early, saying that it is a genuine 90-day corn. Old farmers claim that white corn as a class will do much better on rather poor land than will yellow corn. Whether this be true or not, if one of our customers in Northern Ohio or Pennsylvania wants a good white corn of good looks and early maturity, get this one.

Right here we wish to say that not knowingly will we advocate the sale of a variety of corn for grain growing which is not well suited to a customer's climate. Nothing would eventually hurt as much as would such a foolish and miserable lot of advice. That is one reason why we back up our pedigreed calico corn so staunchly. We know it will ripen early, because it has always done so for over 30 continuous years.

### PRIDE OF THE NORTH CORN

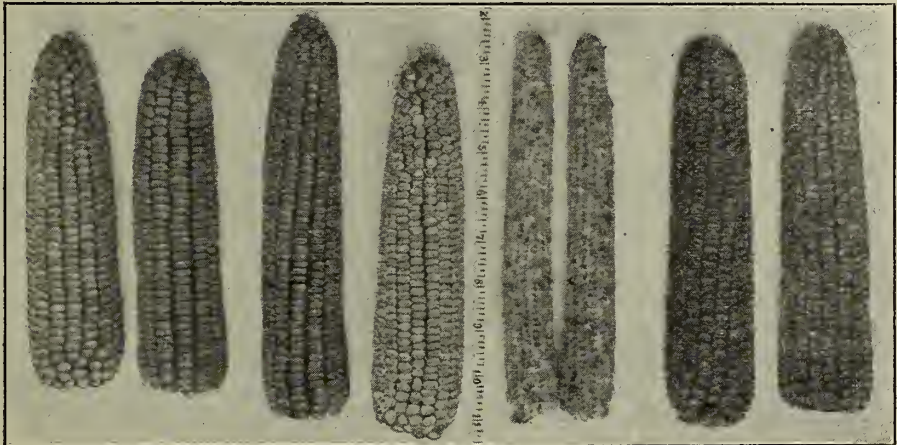
Pride of the North Corn is a beautiful yellow dent corn which has been selected as much as possible for early maturity and a big yield of grain. Ears are of course not so large as Reid's Yellow Dent Corn, but shape o

ears are somewhat like it. Pride of the North Corn should and does in many places hold the same relative position in farmer's estimation in Northern Ohio which is held by Reid's Yellow Dent in central Ohio. The kernels are deep the cobs are small and red in color and the fodder is of fair size with plenty of leaves. This variety is a great favorite for ensilage in central and northern New York.

### WHITE CAP YELLOW DENT CORN

There are a great many strains of white cap yellow dent in Ohio, because after all any farmer who crosses a white variety of corn on a yellow one will eventually have a strain of white cap yellow dent corn. The white cap corn which we sell is grown by men who have tried and succeeded in producing a very valuable strain of early maturing corn. Our strain is a little on the rough order and is of a good fair size with deep kernels and not a large cob. We tried the seed last year in this section and it ripened O. K. The principal reason for that in our judgment is: the seed was grown in a more northern latitude than ours. White cap yellow dent is a great favorite among a large class of farmers.

Typical ears of five early-maturing varieties of Ohio corn.



Huron Dent

Pride of  
the North

White  
Cap

Cobs of  
Calico Corn

Stone's Calico

### EARLY HURON DENT CORN

This is the very earliest yellow dent corn which we have for sale and it is certainly a good one. If you want a yellow corn which will get ripe order this one and you won't make a mistake. This is the one prominent variety recommended for ripening in New York. It has good fair sized ears as may be seen by comparison of ears in our illustrations. The kernels are reasonably deep and cobs small. Our seed is raised up in the north part of Ohio and it gets ripe. This is a variety of corn which we like to advise a man to grow, because while he might be a little ashamed of size of ears at husking time compared with ears of his neighbors' big, punky, immature corn, yet when the corn is in the crib and gets thoroughly dry, he will have good sound grain and the other man will have moldy corn or light weight dried up chaffy ears.

At tests at Ohio Experiment Station at husking time they found that so called ripe crops of corn of different varieties varied in moisture content all the way from 15 to over 30 per cent moisture. Now think of growing corn which is about one-third water and yet that is what lots of farmers do and then they blow about the size of the ears of corn at husking time.

We try to be honest and sensible about our advice to customers in selecting their seed corn. After that it is up to them to buy what they want, but we most certainly hope that for their best interests they will choose early varieties because it is the safest and best plan.

## SWEET CORN

Every farmer owes it to himself as well as to his family that he provides the table with a good supply of sweet corn through the growing season. There are about 75 to 100 varieties to choose from in the different seed catalogues of the United States. It would be folly for us to list them all for sale. We are in position to supply a quantity of almost any well known variety which a customer may want early in the season, so write to us for bushel prices on any variety you may want and we will try to quote you as low a price as possible for the finest seed we can get of that kind. In a retail way we are handling the following varieties which have the best reputation of any in America. For early varieties we will sell the Peep-of-Day, Premo and Golden Bantam and for general planting for later use, we sell Stowell's Evergreen, White Evergreen, Country Gentleman and Late Mammoth Ensilage Sweet Corn.

### PEEP-OF-DAY

This is said by many authorities to be the earliest of all varieties of sweet corn. It is remarkably sweet, many claiming it to be the sweetest of any variety of early sweet corn. It grows from 3½ to 5 feet high and often produces 2 or more 12-rowed ears of about 6 inch length. It is sold under several names.

### PREMO

This is another very fine variety of extremely early sweet corn, very productive and of the finest flavor. It will stand much earlier plantings than most early varieties and should furnish good ears for boiling in two months from sprouting time.

### GOLDEN BANTAM

This variety of sweet corn is so very good and sweet and delicious that no words in the English language can fittingly express the esteem in which it is held by people who know it. It is one of the most popular varieties of sweet corn in America. It has yellow kernels, which resemble little kernels of soft field corn in color only. Stalks grow 4 to 5 feet high often bearing 2 to 3 ears apiece. If you can only plant one early variety then plant this one.

### STOWELL'S EVERGREEN

The favorite sweet corn for canners and market gardeners. Good for late use and for home consumption. Ears are very large with deep tender deliciously-flavored white kernels. It is very productive both of ears and fodder.

### COUNTRY GENTLEMAN OR SHOEPEG

This another old reliable variety of the finest variety. It produces ears 8 or 9 inches long, covered with deep pearly grains of pure white corn which keep tender and fit for use for a long time.

### WHITE EVERGREEN

White Evergreen is a greatly-improved pure white strain of Stowell's Evergreen. This variety grows from 5 to 7 feet high and often bears two perfect ears, completely covered with deep pure-white kernels of exquisitely-tasted corn. This variety fills a long-felt want for a heavy cropper of the finest product.

### LATE MAMMOTH ENSILAGE SWEET CORN

In some of the dairy sections in the Northern states we sell large quantities of this sweet corn seed for growing green forage and ensilage. This sweet corn makes very fine flavored ensilage, cattle relishing it remarkably well. Planted with our Northern Ohio acclimated Medium Green Soys it gives New York and Michigan dairymen splendid prospects for a dairy ration of the highest quality.



## POP CORN

Pop corn is very nutritious and easily digested and everyone who has a fair chance at good, well popped corn becomes a large consumer. We will sell this season two of the very finest of all varieties, the Mammoth White Rice and the Golden Queen. The quality of seed is as fine as we can buy. The former of these two varieties has pearly white kernels and ears are rough. The latter has golder yellow kernels and is a smooth-eared variety. Both are very productive.

## NEW YEAR RESOLUTIONS

If you have any bad wet spots in your fields which need to be under-drained haul the tile out there now while the ground is frozen. Then dig the ditches and lay the tiles early in the spring without delaying your regular field work.

Make your plans to grow more legumes than ever you have grown in previous years. Buy seed for these crops early in the winter. It is false economy to wait until spring.

Grow a little field of Dwarf Essex Rape in 1915 for the finest of hog pasture. Rape seed is cheap and rape makes lots of succulent feed. Hogs and lambs do well on rape. They now bring good money. See the point?

## PEDIGREED ADVANCED REGISTRY SEED

A study of nearly all of the seed catalogues issued by the most prominent seedsmen in America will show that in the past years, with only a very few exceptions, no mention is made in them about pedigreed strains of farm seeds. This we do not consider so very remarkable because the largest and oldest seedsmen have developed their business mostly along the lines of garden and flower seeds. An up-to-date, comprehensive study of this largest branch of their business takes so much of their time that they are unable to keep thoroughly posted as to the strides being taken by progressive scientific agriculturists in the improvement of yields of the different farm crops by systematic breeding or selection of strains of seed through test of comparative yielding abilities of a number of strains.

All this sounds like "Greek" to the older class of farmers, who did not have in their time the chances of securing such an instruction in the scientific principles of agriculture as the younger farmers of America possess today. It was the leaders in the dairy industry who first took the great step forward in the practical improvement of cattle by judging their value, not according to size, color, conformation, or breeding, but by their abilities as producers at the pail, through the course of one, two, or three years' work. Breeder's associations which had been organized for the advancement of the interests of the different breeds of dairy cattle in America, have in the last few years established rules and regulations for the registration of the work of certain cows of each breed in an advanced class of their own, when these cows were able to equal or pass a certain mark set for them by the rules of the association to which they belong.

This class of cows when they have made their records as producers of at least a certain established mark in milk or butter are called advanced registry cows.

Leading plant breeders in America are now propagating strains of corn, wheat, oats, soybeans, potatoes on much the same lines that the best dairy cattle breeders are now following. For years certain varieties of grain, particularly corn, have been bred or improved for show purposes, just as horses, cattle, sheep, swine, poultry and other livestock has been improved. But the best plant breeders in America are now breeding not for looks but for the maximum yields of satisfactory grain or forage under the limits, prescribed by climatic and soil conditions.

We are showing a half-tone illustration of the herd bull in service on Lone Elm Farm. He comes from the advanced registry stock of the American Guernsey Cattle Club. A study of the milk and butter fat yields of his female ancestors will not only show why he was purchased, but will also show the practical principles which are being used by the best plant breeders of today in increasing the yielding qualifications of different farm crops.



Pinehurst Uneeda King (No. 19497) was purchased from the noted Guernsey farm of E. W. Strawbridge of Mocrestown, N. J. His sire is Dairymaid's King (No. 12898), full brother to the famous Dairymaid of Pinehurst, who made a record as champion cow in the great dairy contest in Iowa, several years ago, giving 17285.3 lbs. of milk and 910.6 lbs. of fat in one year. Dairymaid's King is also full brother of Dairymaid's Glenwood of Pinehurst who is sire of four advanced registry daughters.

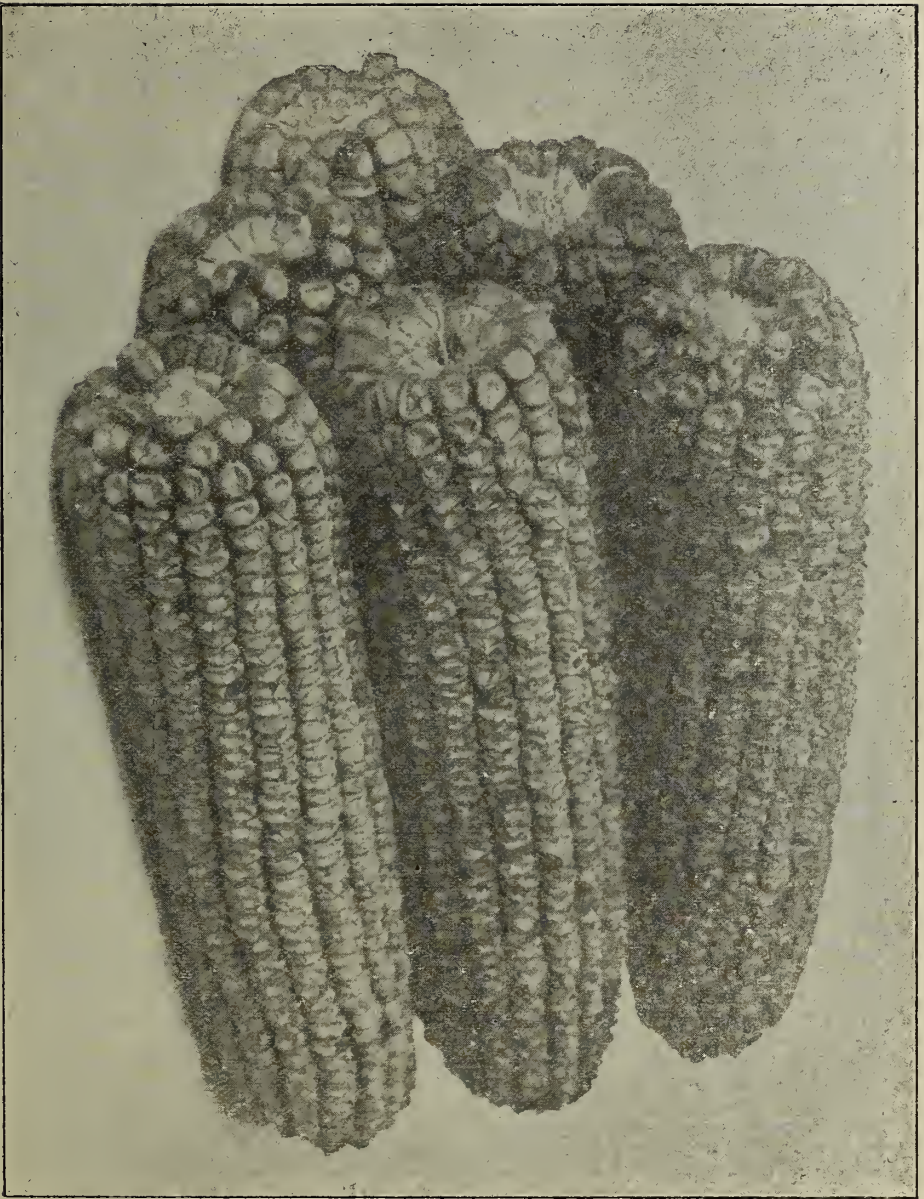
Dairymaid's King was sired by Glenwood Boy of Haddon, No. 4605, who is sire of 26 Advanced Registry daughters and of 13 sons who have sired Advanced Registry Cows. The mother of Dairymaid's King is Dairymaid of Elm Place, No. 14197, who had an A. R. record of 12176.9 lbs. of milk and 668.3 lbs. of butter fat. She is mother of Dairymaid of Pinehurst, and also of Lady Dairymaid of Pinehurst, who has a record of 9669.8 lbs. of milk and 523.8 lbs. of fat at 2 yrs. 7 mos. age.

The dam of Pinehurst Uneeda's King is Lady Uneeda of Pinehurst, No. 29719, who has an A. R. record of 6122.3 lbs. of milk and 327.8 lbs. of butter fat at 2 yrs. 1 mo. age. She is sired by Stransford's Glenwood of Pinehurst, No. 13609, five of whose A. R. daughters average almost 448 lbs. of butter fat in one year, all at very early ages. This bull was sired by Glenwood Boy of Haddon, No. 4605, and his dam, Stransford's Princess, No. 11740, has an A. R. record of 12279.7 lbs. of milk and 725.6 lbs. of butter fat.

The dam of Lady Uneeda of Pinehurst is Uneeda C. who has an A. R. record of 9771.1 lbs. milk and 465.0 lbs. fat. Uneeda C. is also dam of the A. R. cows Pride of Sedgely, who has a record of 9166 lbs. milk and 497 lbs. butter fat at 4½ yrs. of age, and of Uneeda of Pinehurst, who has records of 9368 lbs. milk and 390.9 lbs. of fat at 3¼ yrs. and 9999.9 lbs. milk and 407.3 lbs. of fat at 5 2-3 yrs.

How much better will be our chances of securing Guernsey cows of very high production from Pinehurst Uneeda's King than they would have been had we simply purchased a pure bred Guernsey bull none of whose ancestors had ever been officially tested and proven to be very high producers? If a man can appreciate this advantage, he ought to appreciate just as well the advantage of growing pedigreed grain of different kinds.





Stone's Pedigreed Early Calico Corn.



## STONE'S PEDIGREED EARLY CALICO CORN

Before entering into a description of our variety of corn, we wish to make several remarks.

In our latitude, only about 40 miles south of Lake Erie, we must have a variety of corn which will ripen in a short season, regardless of yield. We need ears of corn having slender cobs, so that in an off season for ripening we won't have to be tormented with waiting on big, thick, soft cobs to dry. We also want corn plants of good, fair size, which won't blow down easily in stormy weather. If we can find a good yielding, well acclimated variety answering to this description, we are fortunate.

With proportionally few exceptions, corn planting in this section is often delayed until about June 1st. Now as we are liable to have killing frosts the last of September, it is very important that we choose an early maturing corn. We had tried a great many varieties of corn, but up until 1908, had not found one satisfactory to us.

In the spring of 1908, we purchased our original start of the calico corn from Mr. Walter Stratton, of this county, whose father, Jared Stratton, one of the very best old farmers we have ever known, had grown it for 28 years or more, having ripe corn to husk every year that he grew it; this in spite of the fact that he seldom if ever planted corn before May 15th, ordinarily not until the last week in May.

This variety of corn was originally a cross between a very early red-eared corn and a deep-kerneled yellow corn. Fair sized red-speckled or calico colored ears, having the deepest grains or kernels, have always been chosen by the Strattons for seed and we have continued the practice. But regardless of this rule, there has always been some all-red and all-yellow ears show up at husking time, throwbacks in breeding, we suppose, to the original red and yellow foundation ears of this variety.

Our corn breeds a large proportion of deep kerneled rough ears. Almost all very deep kerneled varieties are rough ones. On good soil it fills out very good at tips and butts. The objection to the roughness in husking is more than offset by the advantage which comes from the ease in which the ears can be broken off at the shanks, about the easiest of any variety which we have ever husked. Old farmers have said the same thing about it.

This corn has a good, strong habit, and has always stood up well for us during stormy weather. Ordinarily it grows from 9 to 11 feet in height.

In 1908 we planted this variety of corn on May 31st. On Sept. 2nd, we examined every ear of corn in some rows for 40 or 50 rods and found at least three out of every four ears dented.

We had been converts to the principles of corn breeding ever since hearing Prof. C. G. Williams, Chief of the Agronomy Department of Ohio State Experiment Station, give one of his interesting and convincing lectures on the breeding of corn.

On account of the fact that about 9 out of every 10 varieties of corn grown in this section are very unlikely to ripen well every season, we would not try any corn breeding work at all until we found, by trial at home, that this calico corn was very early maturing and a very high yielder. The first year we grew it, it yielded as high as 80 bushels of shelled corn per acre. This variety seemed to answer so well the purpose of a good foundation for breeding work, that we decided to try an ear-to-row test, and so we secured from Prof. C. G. Williams, one of the world's greatest grain breeders, especially with Indian corn, a complete set of instructions for conducting ear-to-row tests and other corn breeding work.

We selected for this ear-to-row test the twenty-five best looking seed ears we had, after going over several times our entire stock of seed from the 1908 crop.

After the ears were numbered from 1 to 25, an accurate, complete description of each ear was taken on blanks furnished for that purpose by the Experiment Station and then each ear was shelled into a separate cloth sack, on which was printed its own number.

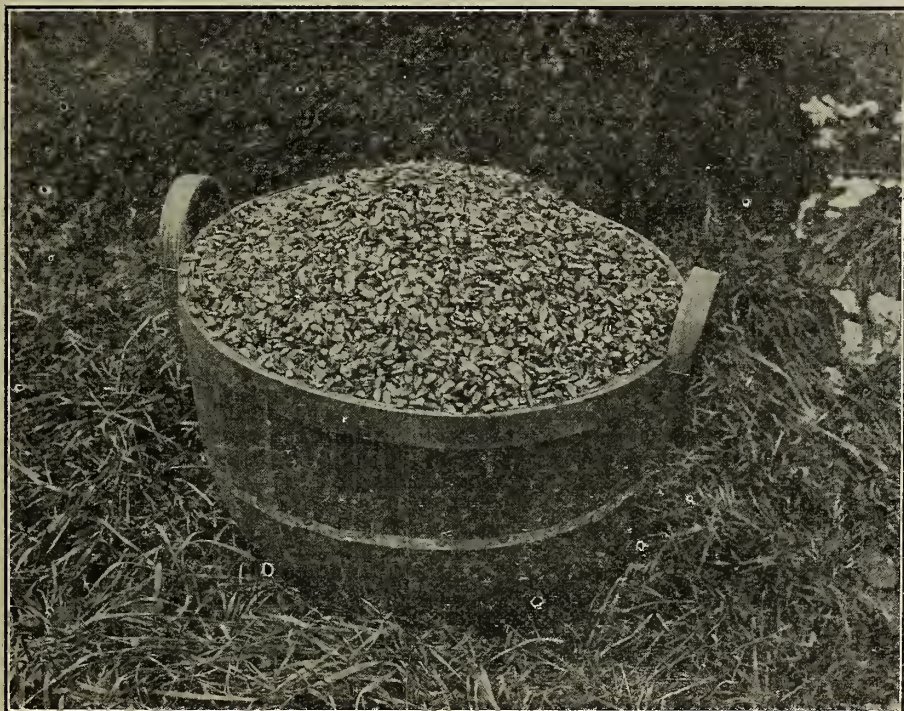
After the cornfield was well prepared for planting, a block of ground was marked off at one end of field in rows  $3\frac{1}{2}$  feet apart each way, the block being 50 hills long and 61 hills wide. This is just the size of a duplicate ear-to-row test of 25 ears of corn, including check rows.

Rows Nos. 1, 7, 13, 19, 25, 31, 37, 43, 49, 55 and 61 were check rows planted to show the variation in yields of every 6 rows due to changing qualities of soil, etc.

Each of the 50 hills in both rows No. 2 and No. 32 were planted from the seed in sack No. 1; rows No. 3 and No. 33 from sack No. 2; rows No. 4 and No. 34 from sack No. 3, and so on consecutively until rows No. 30 and No. 60 were planted from sack No. 25. Five kernels were planted in each hill and the stand afterwards thinned out to three stalks per hill.

Plant breeders discovered years ago that every variety of corn, no matter how long it had been grown, contained not only strains of average yielding corn, but also strains of very low-yielding and very high-yielding abilities. And the only way possible to pick out those strains is by the ear-to-row test method.

This was the case in our variety of corn as the ear-to-row test showed a wide variation in yield between different rows of corn; some of the best rows yielding at husking time nearly 50 per cent more corn than some of the poorest rows.



Basket of Stone's Pedigreed Calico Corn, sound and dry. The value of a variety of corn cannot be judged by the appearance of five or ten show ears of that variety.

The great practical problem before the corn growers of Northern Ohio is how to grow the greatest number of bushels of sound dry shelled corn per acre in a short season. We are trying to do this with our pedigreed calico corn.

The regular and duplicate tests of the same ears corresponded well, not only in yield but in other points. For instance: the regular test of one certain ear showed not one barren stalk in the whole row of nearly 150 stalks. In the duplicate test of same ear there were only 8 barren stalks. Other ears in the regular and duplicate tests averaged nearly 40 barren stalks to the row.

Before deciding which were the very highest yielding rows of the 25, fair sized samples of ears were taken from each row and weighed at the time the corn was husked and weighed and each sample was shelled in the winter after it was thoroughly dry and then weighed again. With these figures as a basis the yields of dry shelled corn to the acre were estimated for the highest yielding rows.

The yield of not only the shelled corn per acre, but also of the dry shelled corn



per acre is a very important matter to consider because samples of different strains of corn will shrink different percentages. Shelled corn percentages of different ears in the ear-to-row test varied from 83 to 88 per cent.

Breeding has already made a great improvement in our corn in that respect. We weighed up one lot of selected ears in 1913 which averaged over 90 per cent shelled corn or at the rate of over 61 lbs. of shelled corn to 68 lbs. of ears.

One other point brought out very forcibly by the ear-to-row test was that the shape, color, or looks of ear was no indication whatever as to its yielding qualities. We had one particularly handsome show ear which judging by appearances would turn out to be an easy winner in the ear-to-row test of 1908.

It was rather a rude shock to us when we found out at husking time that this ear produced one of the very lowest yielding strains of any of the 25 ears.

Since that time we have had very little use for handsome ears at a corn show unless they are backed up with big yields in the field.

In 1910, we planted our breeding plot over one-fourth mile away from any other corn field, using for seed the remnants of the four highest yielding ears of the 1909 ear-to-row test.

There were 5 rows of corn in the breeding plot. Rows 2 and 4 of the plot were planted from the remnant of highest yielding ear, and rows Nos. 1, 3, and 5 from the remnants of the 2nd, 3rd and 4th highest yielders respectively.



A Field of Stone's Pedigree Calico Corn.

As soon as corn in the breeding plot began to tassel and silk, we began pulling out all the tassels from rows 1, 3 and 5. All the corn in these rows were consequently thoroughly cross-pollinated by the tassels in rows 2 and 4, planted from the highest yielding ear. All the ears grown in rows 1, 3 and 5 were kept for seed for our 1911 crop. Seed from rows 2 and 4 was not kept because it was almost thoroughly inbred.

To prove that the principle of corn breeding was correct in more ways than one, we planted several rows of corn in 1911 from the very smallest nubbins we could find in rows 1, 3 and 5. **In the fall of 1911 we husked just as fine large ears from those specially planted rows from nubbins seed as from any.** The kernels of corn on the nubbins held the germs of high yielding corn, and blood will tell in pedigreed corn as well as in pedigreed live stock. The rows of corn in the ear-to-row test, grown from what proved to be, the four highest yielding ears had very few barren stalks. That habit has become well fixed in the progeny of those ears, so that, unless the corn receives poor care and feed, practically every stalk will carry an ear or nubbins, oftentimes two.

In the fall of 1911 we spent considerable time in our corn field at cutting time, making careful selection of seed ears for our own 1912 crop. Each ear of corn



we selected had to be suitable as judged by a number of conditions. It had to be a good looking ear, thoroughly ripe, of a calico color. It had to come from a good thrifty upright stalk, one of at least three stalks in that hill. The ear had also to hang either level or a little bent down at the tip. The reason for this was that most of the ears of corn damaged by wet weather are those which have their tips turned up, not only apparently to induce all the rain possible to run down inside the husk but also to be the easiest prey for crows, blackbirds, raccoons, and other pests.

This work bore fruit in the 1912 crop of corn for in making a field selection again the next fall, we found that we had a very much larger proportion of the ears hanging satisfactorily than we had in 1911. **We believe that we have done practically all that could be done in 4 years' time to propagate a variety of corn which will give what we want in Northern Ohio;** (that is; the largest yield of sound, dry, shelled corn per acre in a short season).

In harvesting our pedigree calico corn in the fall of 1913, we found that the continuous selection, in the past years, of our seed corn on the growing stalks for our own individual planting had caused about three-fourths or more of all the ears of the 1913 crop to hang either horizontal or even lower than that, so careful field selection is still improving our corn.

This past year we conducted another ear-to-row test of our calico corn. A few of the rows again showed yields of corn very much above the average. Our next year's field crop will be grown from these high-yielding rows. Next year, 1915, we will have a breeding plot, planted from the remnants of the champion ears of 1914 ear-to-row test. From this plot we will grow our seed corn for planting the 1916 field crop. Favorable reports are reaching us very often about the early-maturity and the yielding ability of our calico corn.

Of course, we know that a speckled red and yellow or (as we call it) calico-colored corn, will not bring quite as much per bushel on the market as a straight yellow corn, but, after all, most good farmers are also good live stock feeders, and have their markets right on their own farms.

Color in corn, after all, is only skin deep. The experts tell us that on the average corn of one color is just as good and rich a food as corn of another color.

The color of a Shorthorn steer or a Wyandotte chicken might affect its market value a little but the color would not affect its food value at all.

After seeing and hearing a great lot of stir and excitement over fancy show corn, when you get back to the farm and take up your business as live stock feeders, what you want most in corn is a variety which, year in and year out, will give you what we have been trying to produce in our corn.

The greatest corn growing seedsmen in America are now breeding their corn more for increased yield than for the production of fancy show corn. Let us keep up with the spirit of the times, especially when the spirit is backed up by good old fashioned common sense.

A word about price of seed corn. It takes so little seed corn to plant an acre, and an acre of good corn will give so much feed, that there is hardly any kind of farm seed for which, judged by sound business standards, we can afford to pay so much money per bushel. One bushel of our seed corn will furnish seed for about 8 acres, at a cost of about 50 cents per acre. Seed from almost any old kind of corn will cost you about 25 cents per acre.

**How much more corn will you have to get from an acre of our corn to pay for the extra seed cost?** Will it pay to grow the best? An increase of from five to ten bushels of shelled corn per acre is the customary gain in yield of a variety after the results of the first ear-to-row test.

This season we have been using the famous Martin seed corn sacks for drying and storing our pedigreed corn. By this method of curing each ear has perfect ventilation and only two points of contact: just where it crosses two wires. Our customers can feel assured that we are trying to do the very best possible, not only in breeding high-yielding corn but in taking the best possible care of seed.

## WARRANTY

Our warranty is the Square Deal. We give in our seed shipments the non-warranty adopted by practically all of the best seedsmen in America, but this is only used by seedsmen to protect them from possible unreasonable and perhaps ruinous legal persecution through personal spite. No sensible seedsmen will knowingly ship out seeds which will hurt his business. We are shipping out seed which is building up a big business for us.

## DIRECTIONS

Write your name, postoffice address and other particulars as distinctly as possible in your correspondence with us.

Use Order Blanks if possible. Don't forget to give correct name of freight or express station. Is your R. R. station a prepaid one?

Order Seeds Early. This is the only way in which you can give us a fair chance to serve you as well as we would like to do it.

**Loss By Freight.** In case of loss or damage by freight, have freight agent note same on freight bill before paying it. Damages can then be collected from them.

Atwater is on the C. & P. R. R. and Cleveland and Alliance Electric Line, about half-way between Alliance and Ravenna. Adams and Wells-Fargo express offices are here. Good Pennsylvania R. R. train service and electric cars every hour from both north and south. Seed Farm is located  $\frac{1}{2}$  mile west and 1 mile south of Atwater R. R. depot.

**Terms of Sale:** Cash with order. We accept drafts, P. O. orders, Express Co. orders and checks at their face values. Do not send any in letters; it is not sensible to do so. If satisfactory reference is furnished to us we will ship by freight, sight draft, attached to bill-of-lading or by express C. O. D., customer to pay all expense charges.

**Prices:** On account of the fluctuation in prices of farm seeds, we give no prices in catalogue but publish a price list, which we change to suit the market. **We are very much pleased to mail price lists to all who request us to do so.** Prices are subject to change without notice and being unsold.

## NORTHERN OHIO ACCLIMATED SEED

One of the most desirable qualities which a variety of corn or soybeans may have is early maturity. To get an early-maturing crop of soybeans or corn the farmer must of course plant seed selected from an early-maturing crop. That, however, is not the whole story. If one takes seed from a crop grown in a warm favorable climate and plants it in a cooler, more northern climate, the crop from it will act very much as if it did not wish to ripen at all. It is not acclimated to cooler more adverse conditions.

Now northern acclimated seed will produce a very satisfactory crop if planted farther south, but southern-grown seed does not do nearly so well when planted to the north.

We are located up in that part of north-eastern Ohio, which judged by careful records for many years, has the coolest shortest growing season of any part of the State. Our corn and soybean varieties in order to ripen well must be of very early-maturing strains. Our pedigreed calico corn comes from a strain of corn which has ripened seed on the same farm in Atwater, every year for 30 or 35 years back. The majority of the other varieties of seed corn which we sell are of northern Ohio acclimated stock, as well as our calico corn. We know how important it is to the success of our customers in New York, Michigan and other states, having like climatic conditions, to have northern-acclimated seed corn and soybean seed of early-maturing strains or varieties. So we endeavor to get as much of our seed corn and soybean seed as possible from growers in our own locality.

Mammoth Yellow soybean seed and other late varieties of soys as well as the large late-maturing varieties of ensilage corn we have to purchase, of course, in the South, because the season is much too short here to give them time enough in which to properly mature a crop.



Two Northern Ohio acclimated maidens in a field of Northern Ohio acclimated Peking Soys on Lone Elm Farm, Atwater, O.

The U. S. Dept. of Agriculture acting in co-operation with the State Agricultural Experiment Stations and County Agricultural Improvement Associations, have in the last few years engaged quite a large number of the best up-to-date scientific farmers as agricultural advisers or agents in different counties, scattered over many states. Practically every one of these experts located in all of the more northern States very strongly advocates the planting of northern-acclimated seed.

Good common sense ought to tell any farmer that the supply of northern-acclimated seed corn and soybean seed is very much less than that of seed produced in the great central corn belt. Each season we sell out of every bushel of northern Ohio soybean we can get; sometimes quite a long time before the selling season is over. This winter on account of the record breaking drouth in the summer and the early fall frosts, the supply of good seed has been much reduced. It takes no prophet to see that there will not be nearly enough seed to supply the demand by planting-time. If our customers wish to get the best seed we advise them to order it from us as soon as possible after getting our catalogue and price list.

Now is a good time to purchase one or two carloads of Kelley Island Lime and haul it home while the farm teams have but little work to do. Then you will have the lime on hand ready to use when the time comes to prepare the ground for spring crops. Lime can be bought for less money now than it can during the spring and fall rush seasons. Write to us for prices.



WM. McD. STONE

SOYBEAN AND  
CORN SPECIALIST  
ATWATER, OHIO.  
PORTAGE CO.

"THE CAUSE"  
INOCULATED SOYBEAN ROOT  
(SEE FRONT COVER FOR THE RESULT)

